AP-1590

FIG. 1

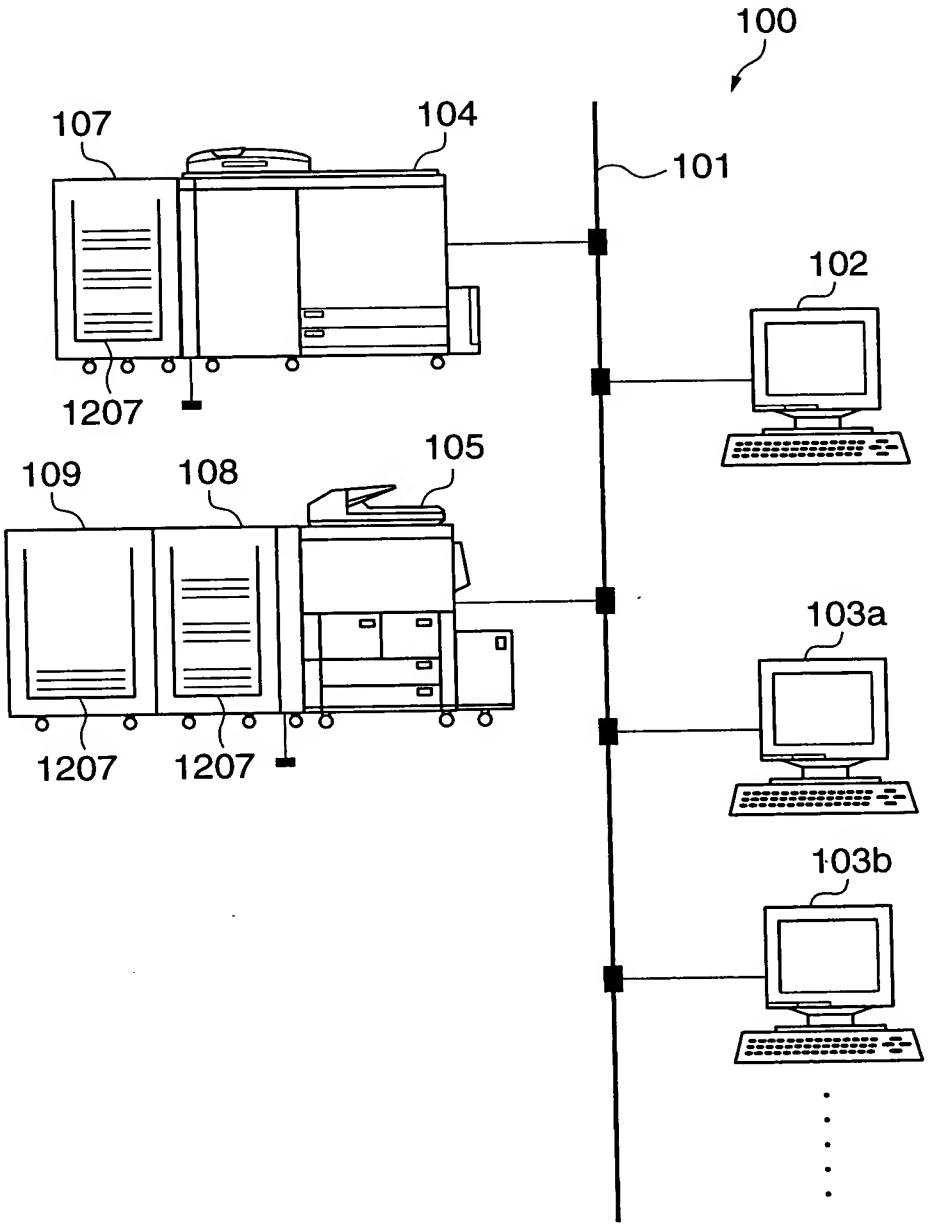


FIG. 2

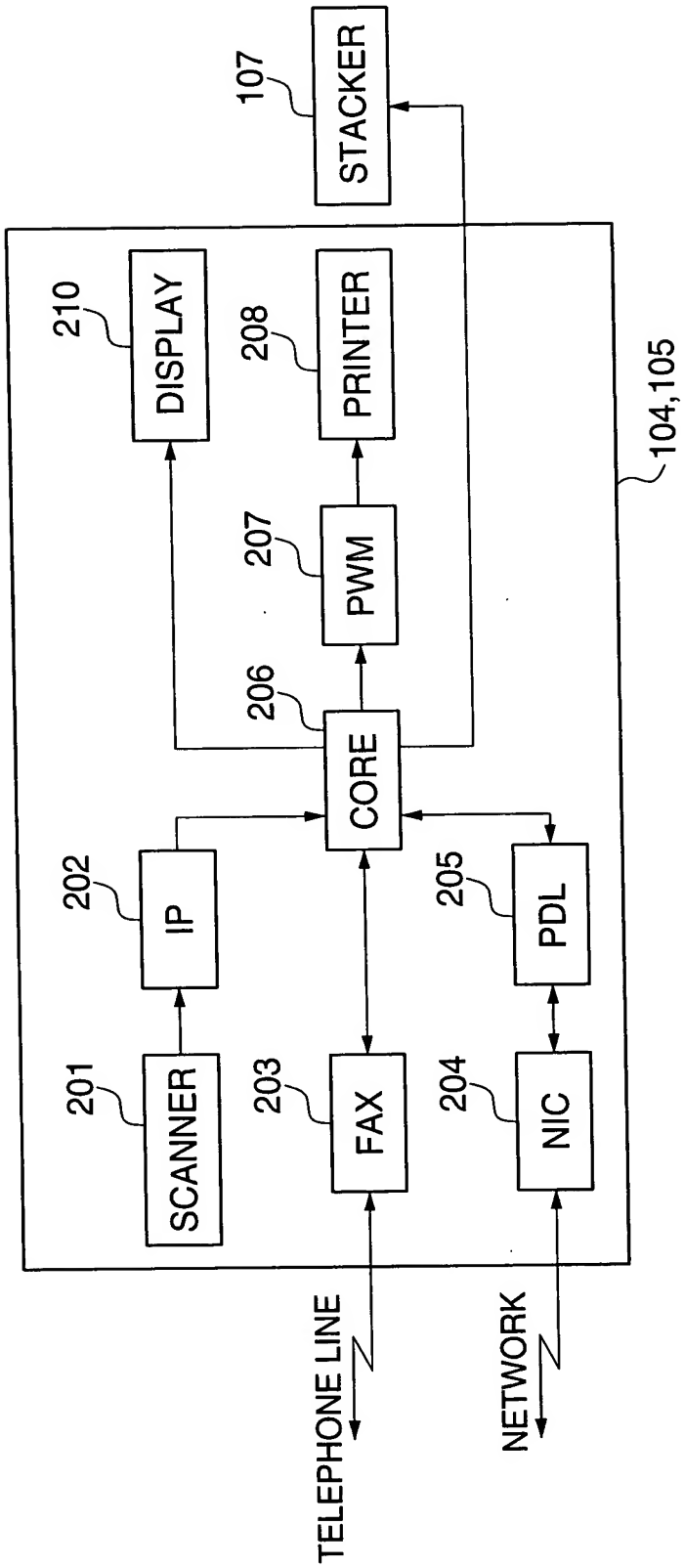

107
STACKER
210
DISPLAY
208
PRINTER
104,105
207
PWM
206
CORE
202
IP
205
PDL
201
SCANNER
203
FAX
204
NIC
TELEPHONE LINE
NETWORK

FIG. 3

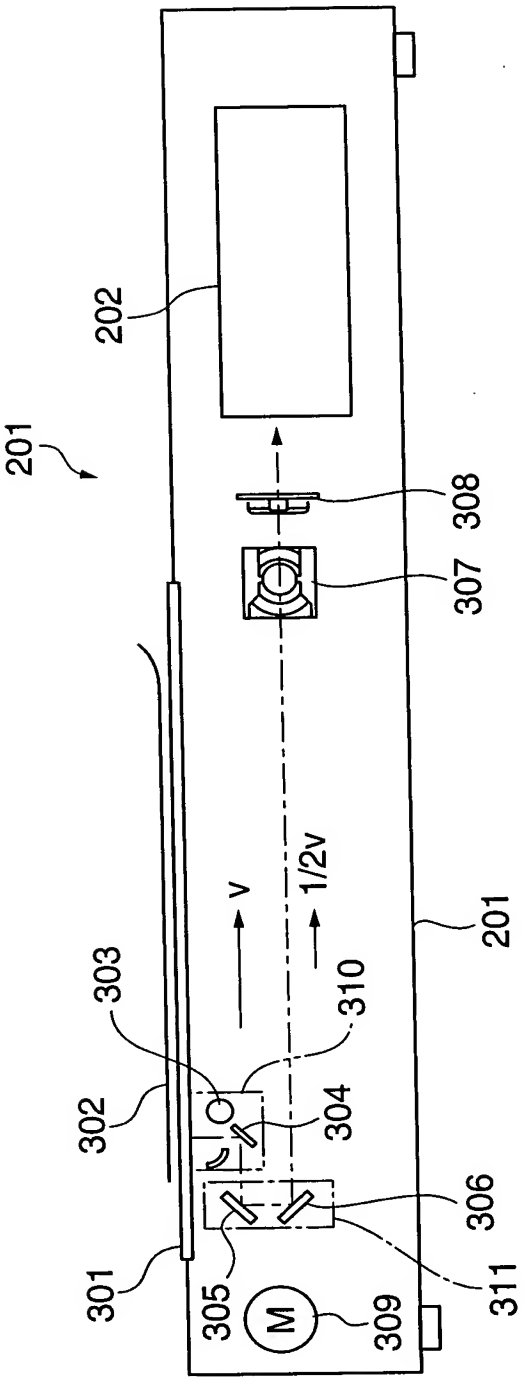


FIG. 4

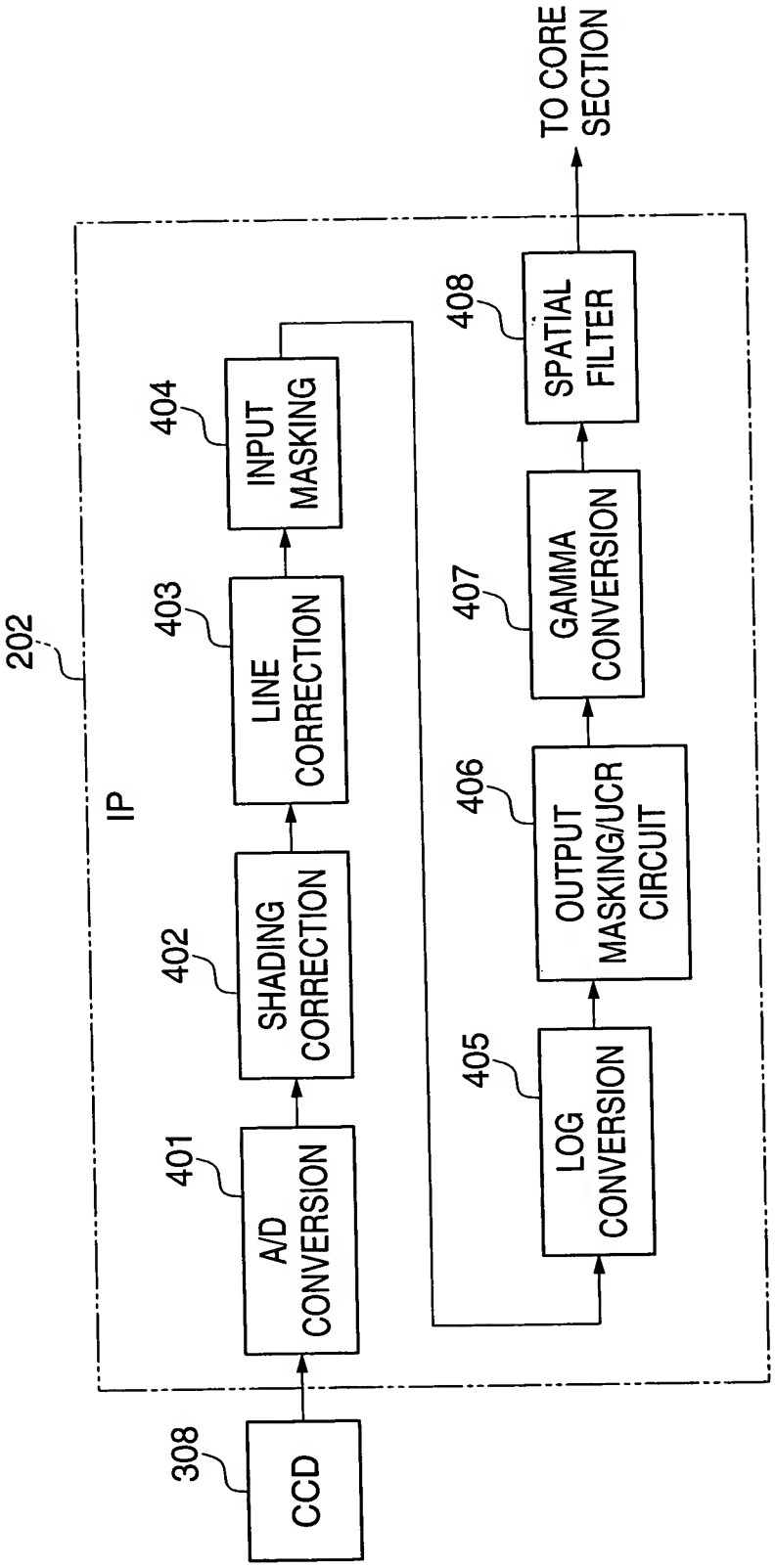

TO CORE SECTION
202
IP
308
CCD
401
A/D CONVERSION
402
SHADING CORRECTION
403
LINE CORRECTION
404
INPUT MASKING
405
LOG CONVERSION
406
OUTPUT MASKING/UCR CIRCUIT
407
GAMMA CONVERSION
408
SPATIAL FILTER

FIG. 5

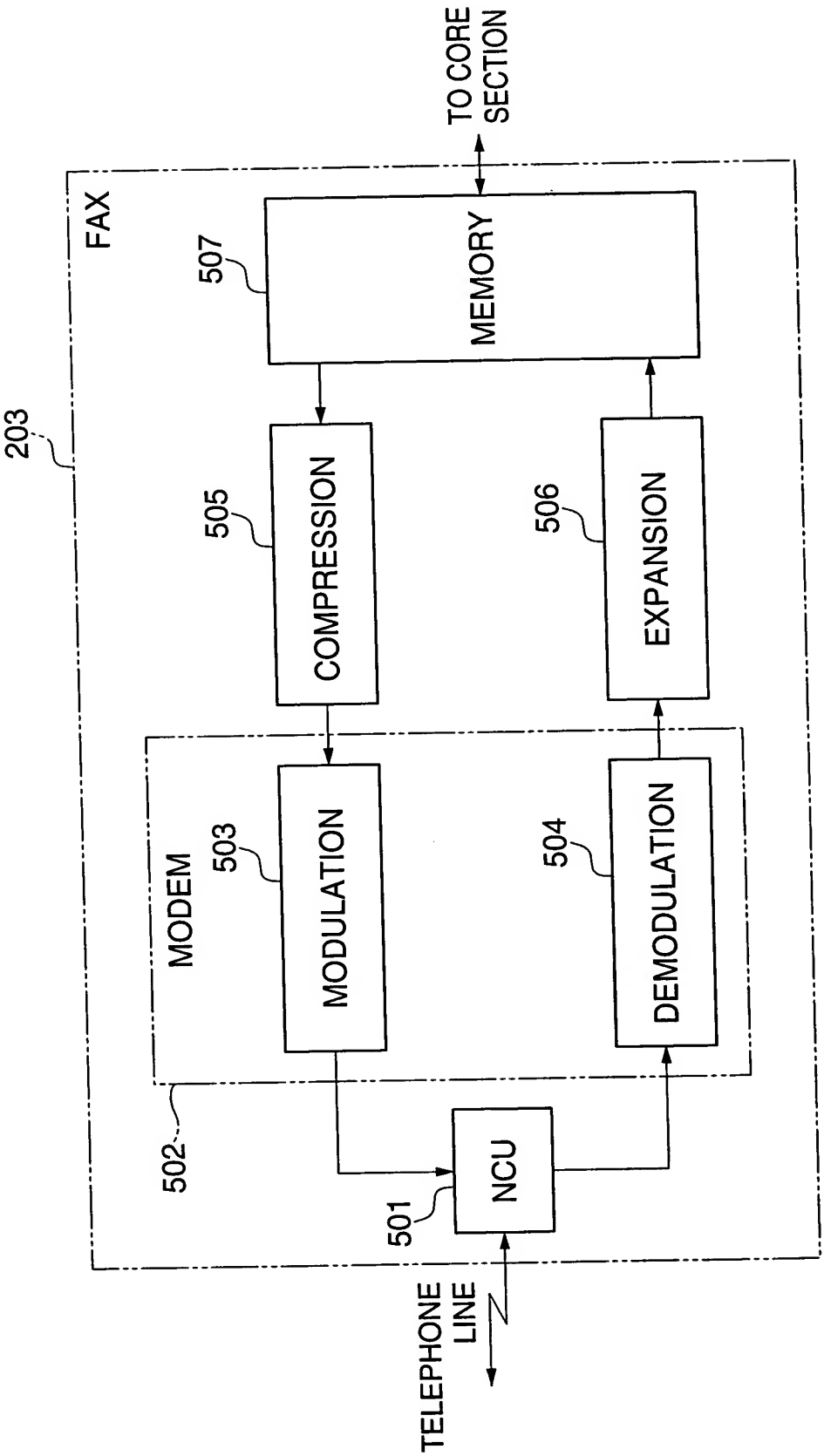

TO CORE SECTION
FAX
507
MEMORY
203
505
COMPRESSION
506
EXPANSION
MODEM
503
MODULATION
504
DEMODULATION
502
NCU
501
TELEPHONE LINE

FIG. 6

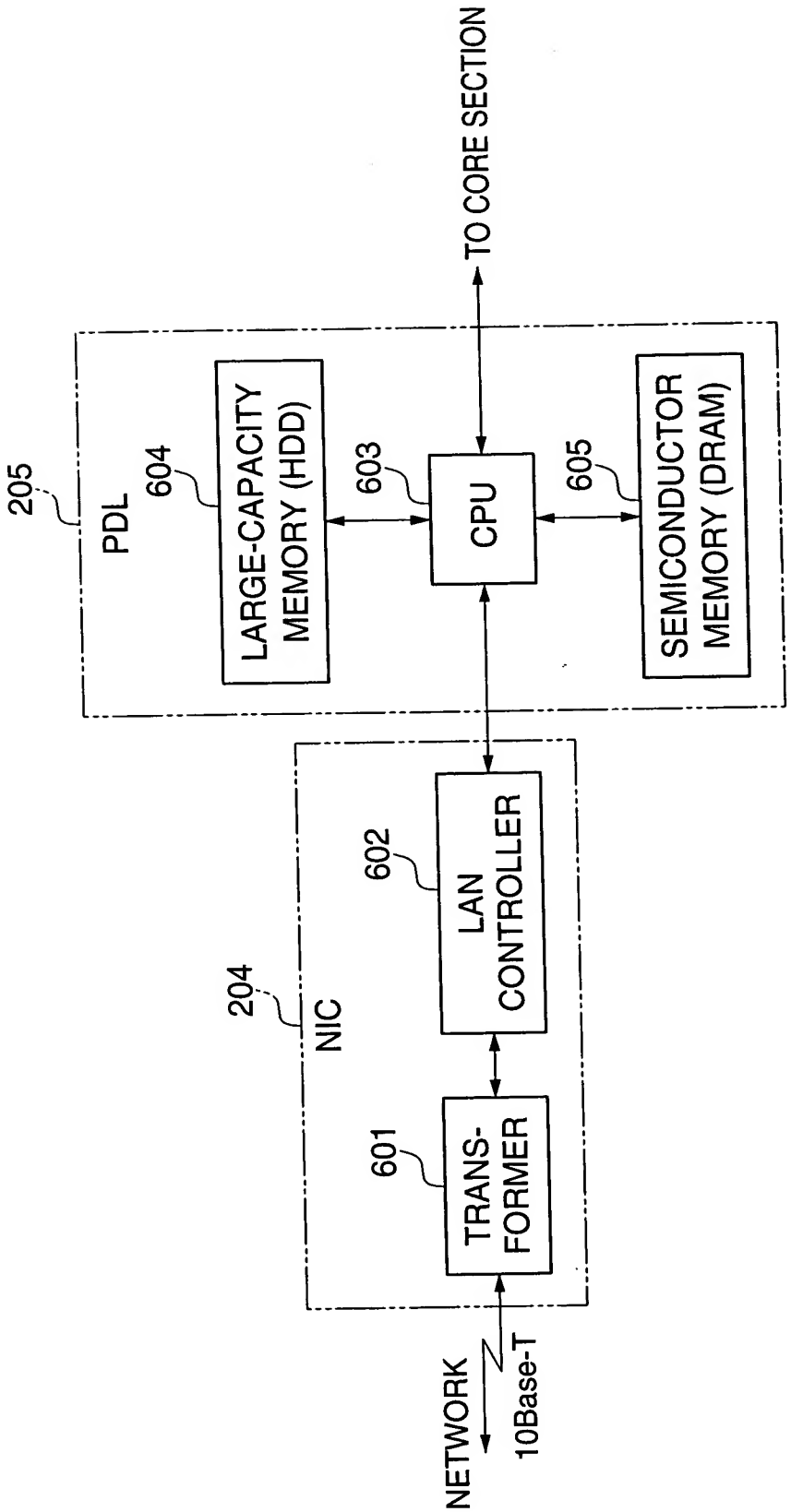
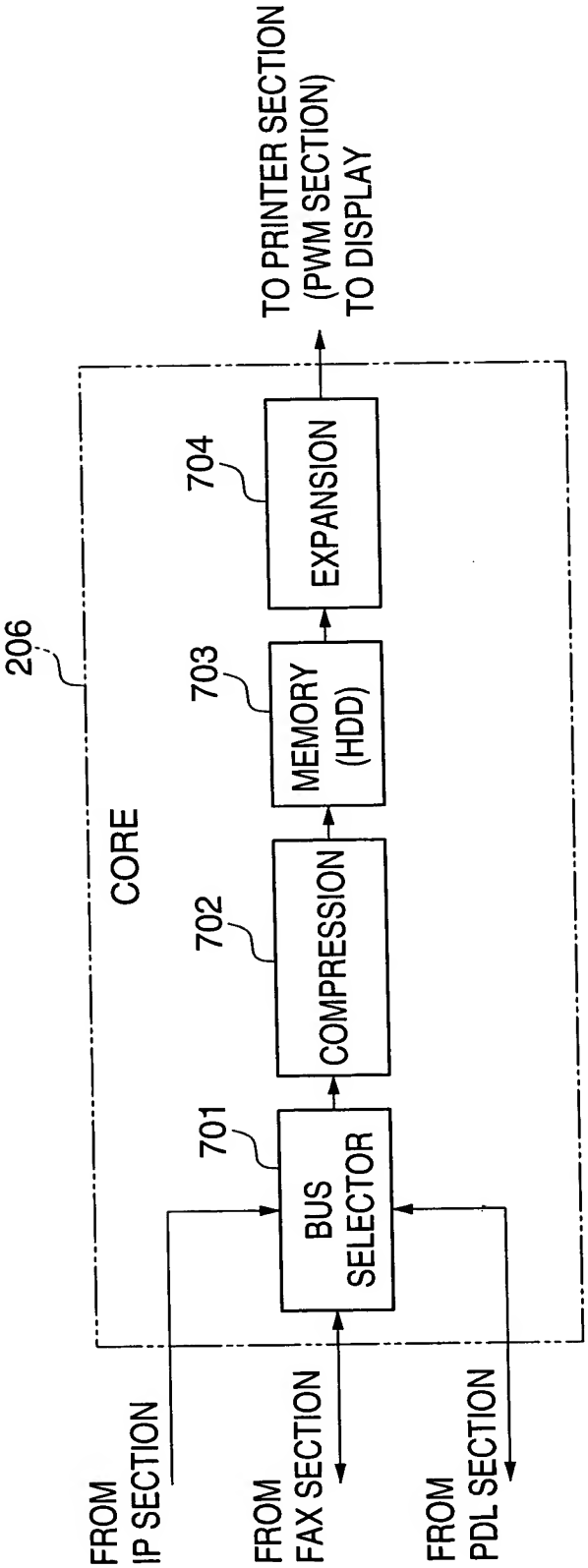

TO CORE SECTION
205
PDL
604
LARGE-CAPACITY MEMORY (HDD)
603
CPU
605
SEMICONDUCTOR MEMORY (DRAM)
602
LAN CONTROLLER
204
NIC
601
TRANS-FORMER
NETWORK
10Base-T

FIG. 7


TO PRINTER SECTION
(PWM SECTION)
TO DISPLAY
206
CORE
704
EXPANSION
703
MEMORY
(HDD)
702
COMPRESSION
701
BUS
SELECTOR
FROM
IP SECTION
FROM
FAX SECTION
FROM
PDL SECTION

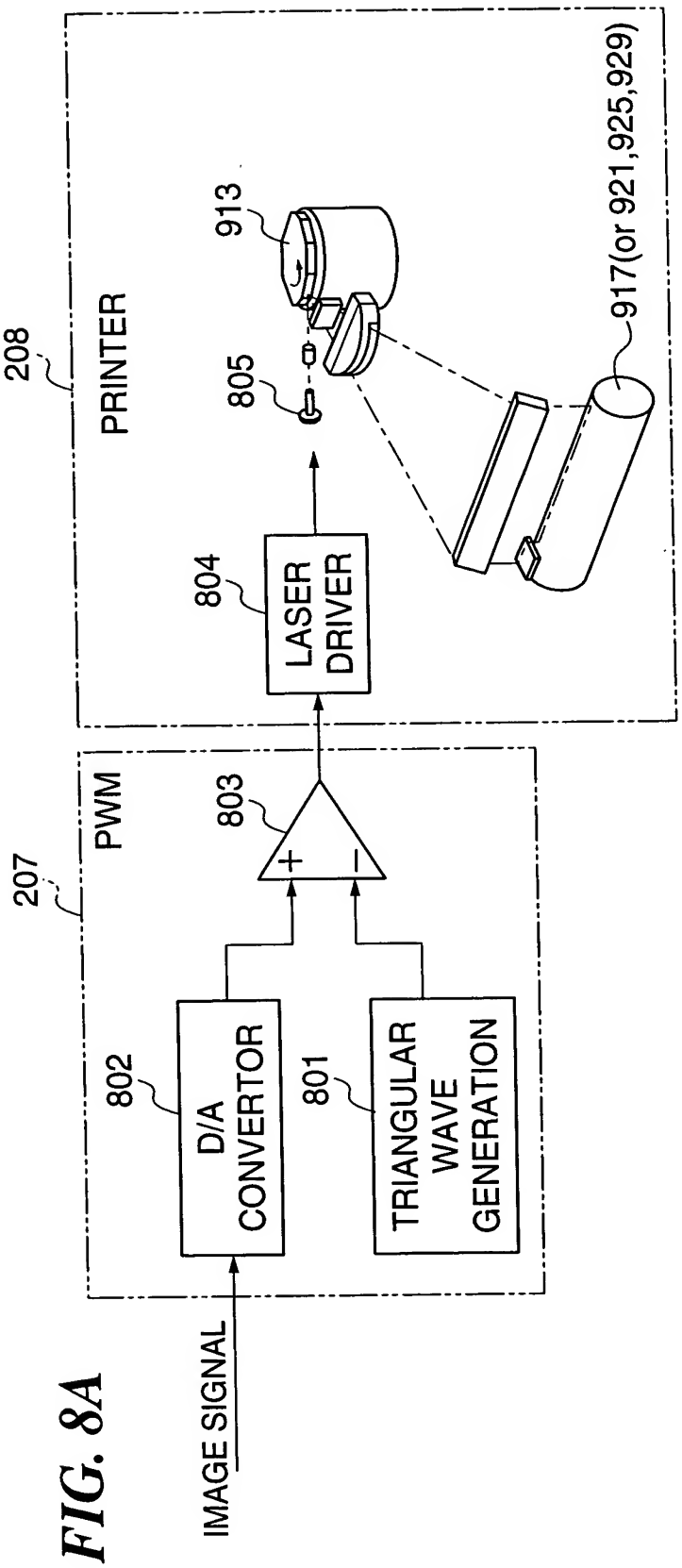

208
PRINTER
913
805
917(or 921,925,929)
804
LASER DRIVER
207
PWM
803
802
D/A CONVERTOR
801
TRIANGULAR WAVE GENERATION
IMAGE SIGNAL

FIG. 8A

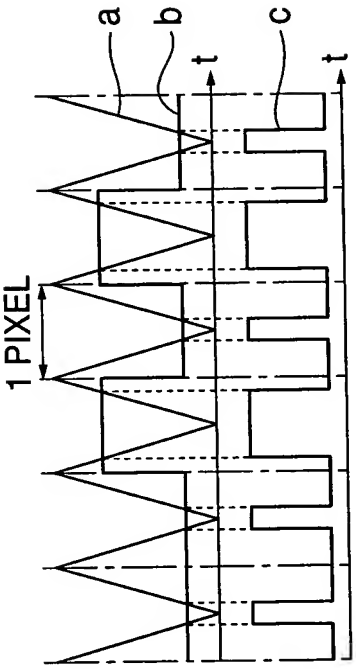

a
b
t
c
t
1 PIXEL

FIG. 8B

FIG. 9

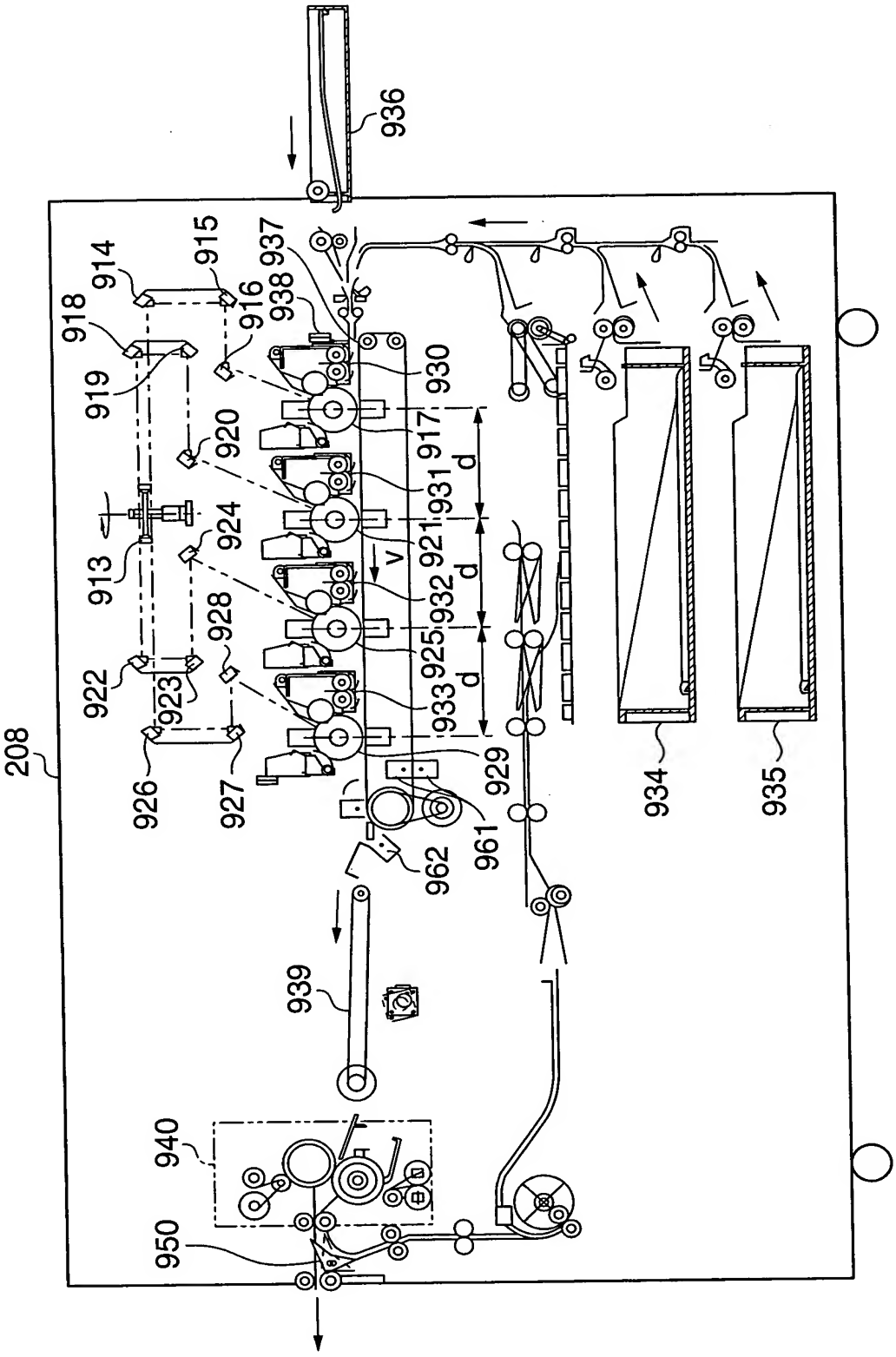

936
914
915
937
916
938
918
919
930
920
917
931
d
924
913
921
V
932
d
928
925
922
923
933
d
926
927
929
961
962
934
935
208
939
940
950

FIG. 10

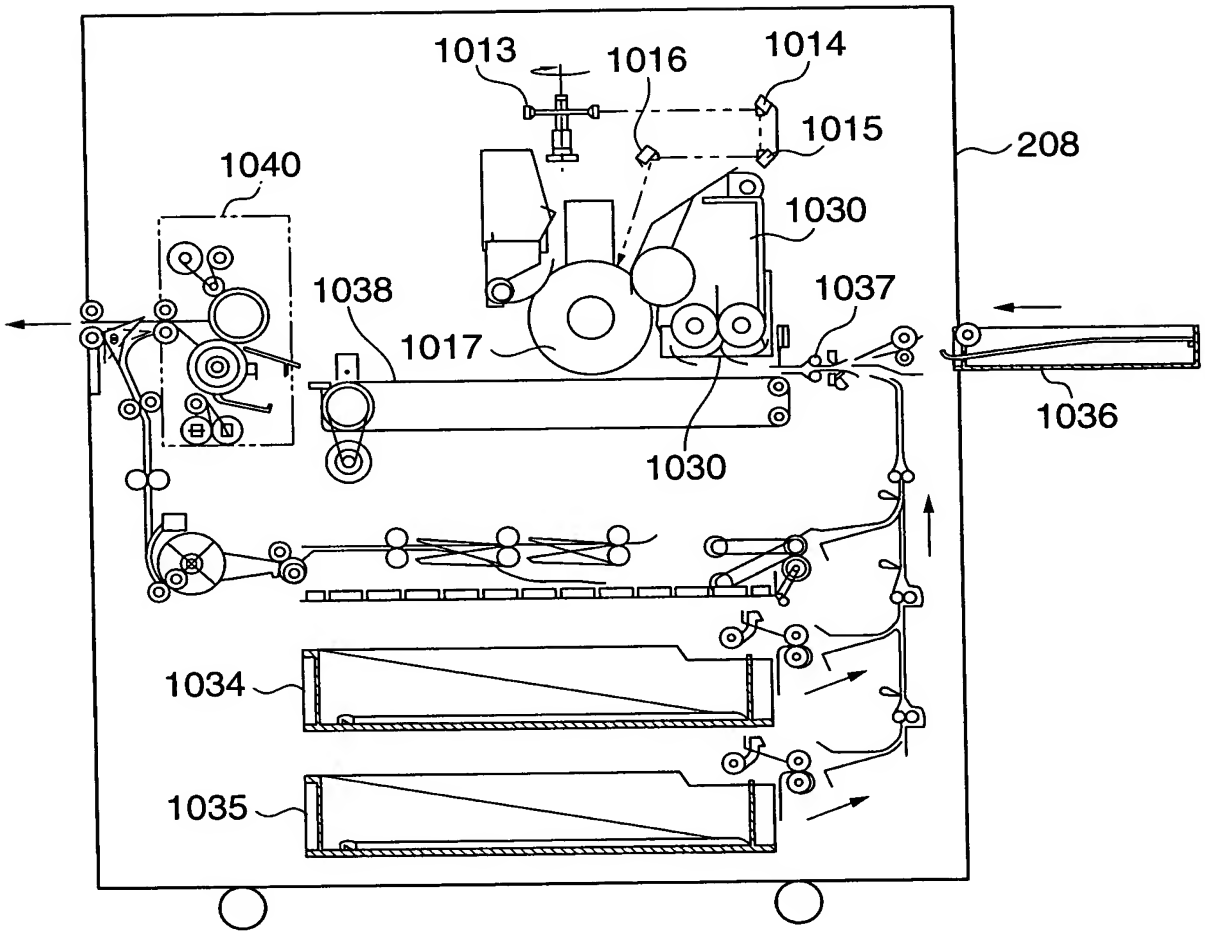

1013
1016
1014
1015
208
1040
1030
1038
1037
1017
1036
1030
1034
1035

FIG. 11

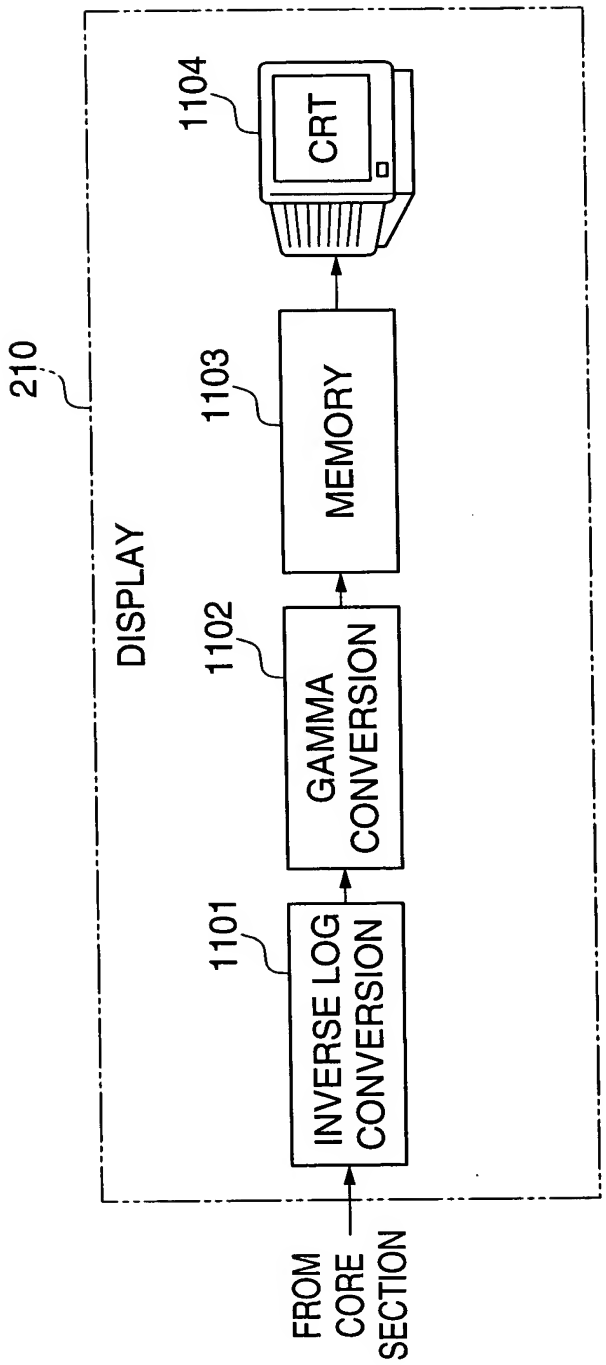

210
DISPLAY
1101
INVERSE LOG CONVERSION
1102
GAMMA CONVERSION
1103
MEMORY
1104
CRT
FROM CORE SECTION

FIG. 12

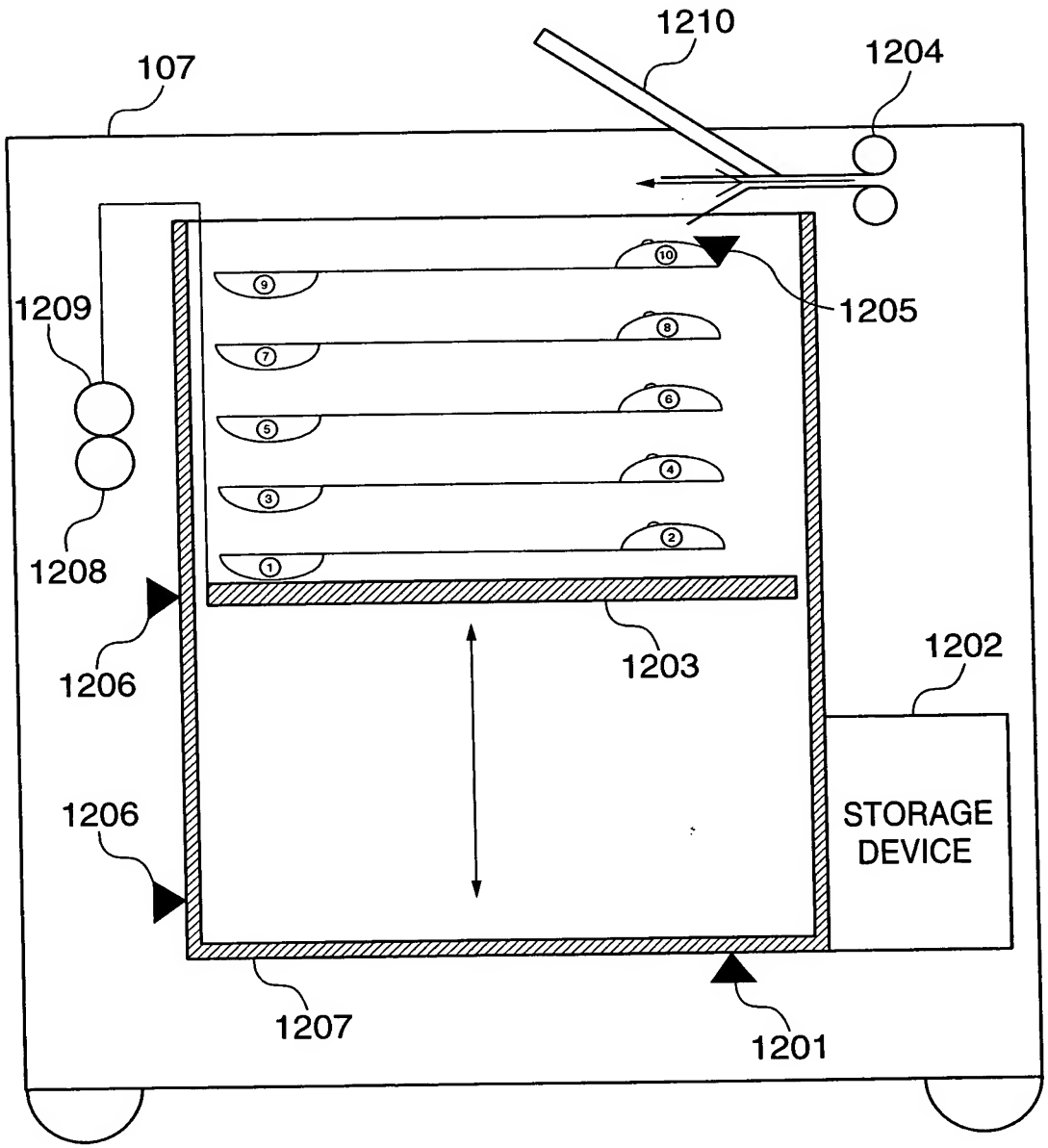

1210
1204
107
1209
1205
1208
1206
1203
1202
STORAGE DEVICE
1206
1207
1201

FIG. 13

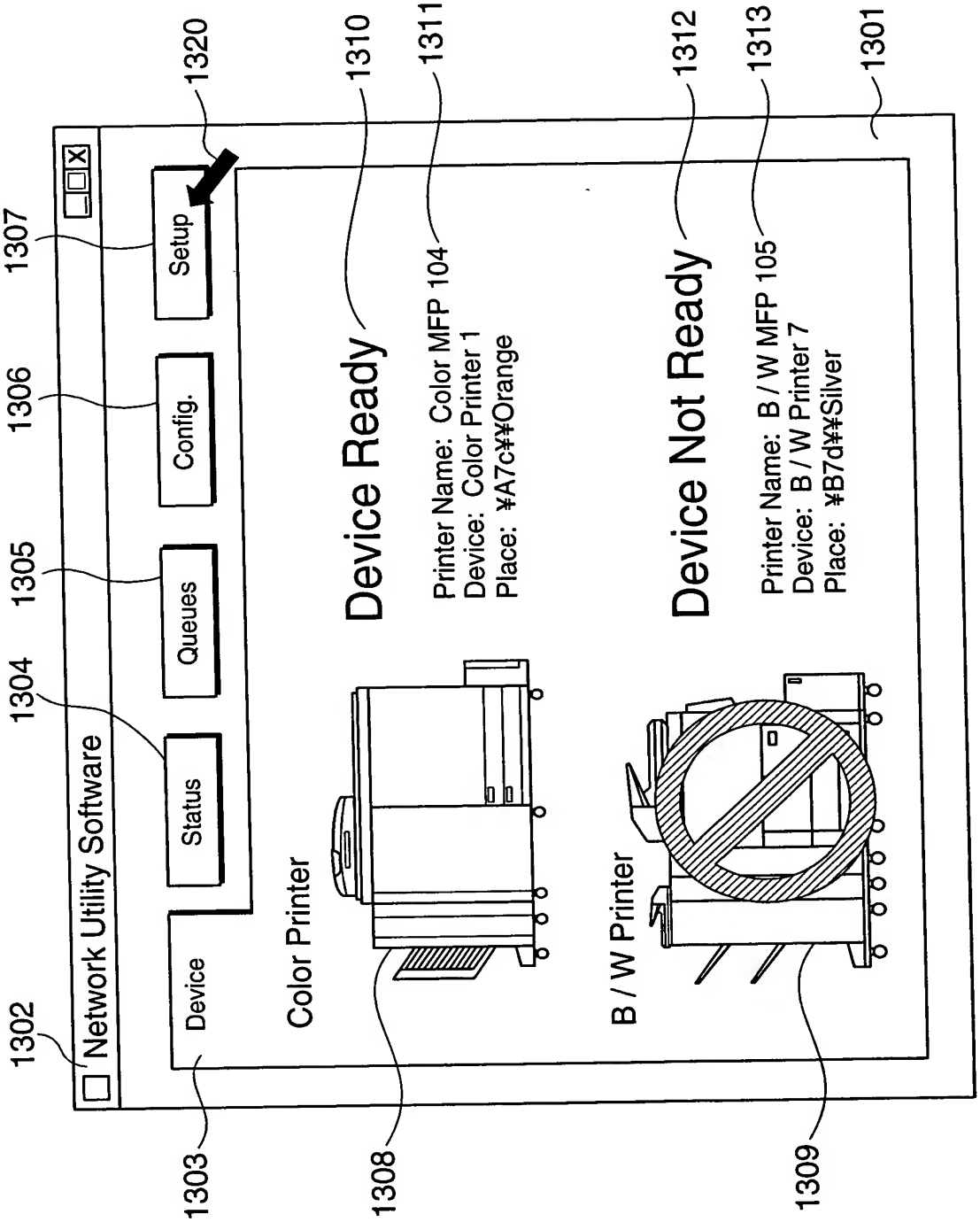

Network Utility Software
Device
Status
Queues
Config.
Setup
Color Printer
Device Ready
Printer Name: Color MFP 104
Device: Color Printer 1
Place: ¥A7c¥¥Orange
B / W Printer
Device Not Ready
Printer Name: B / W MFP 105
Device: B / W Printer 7
Place: ¥B7d¥¥Silver
1301
1302
1303
1304
1305
1306
1307
1308
1309
1310
1311
1312
1313
1320

FIG. 14

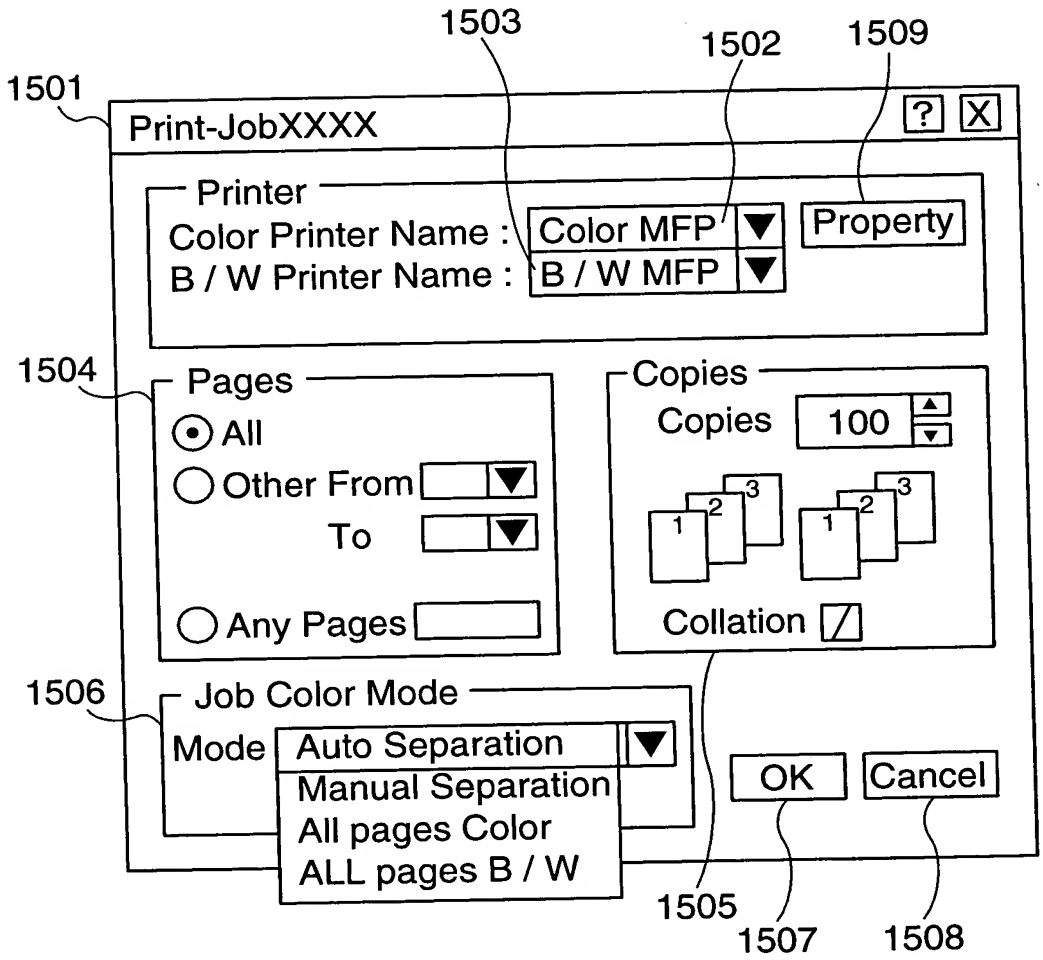

1501
1503
1502
1509
Print-JobXXXX
?
X
Printer
Color Printer Name :
Color MFP
Property
B / W Printer Name :
B / W MFP
1504
Pages
All
Other From
To
Any Pages
Copies
Copies
100
Collation
1506
Job Color Mode
Mode
Auto Separation
Manual Separation
All pages Color
ALL pages B / W
OK
Cancel
1505
1507
1508

FIG. 15

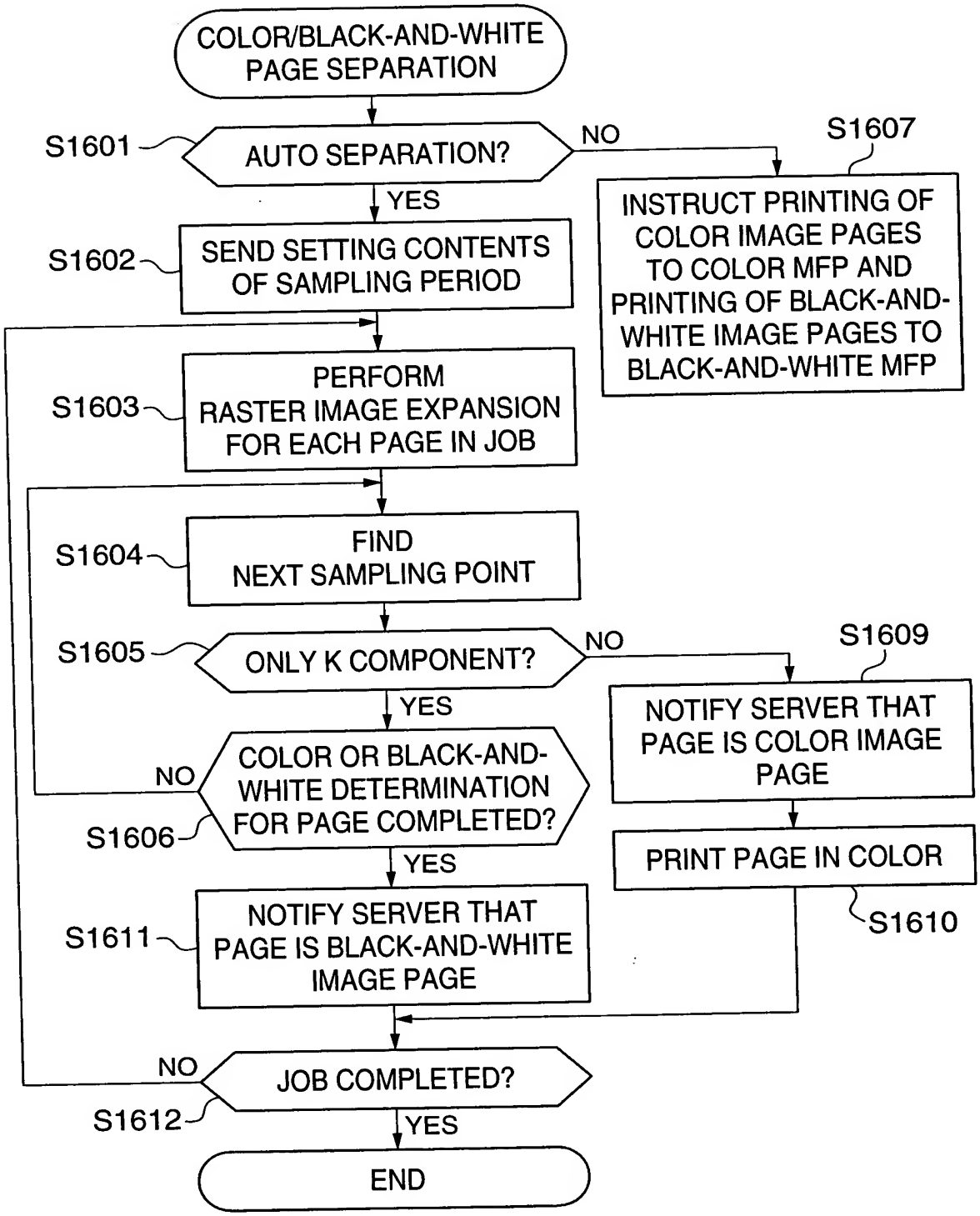

COLOR/BLACK-AND-WHITE PAGE SEPARATION
S1601
AUTO SEPARATION?
NO
S1607
INSTRUCT PRINTING OF COLOR IMAGE PAGES TO COLOR MFP AND PRINTING OF BLACK-AND-WHITE IMAGE PAGES TO BLACK-AND-WHITE MFP
YES
S1602
SEND SETTING CONTENTS OF SAMPLING PERIOD
S1603
PERFORM RASTER IMAGE EXPANSION FOR EACH PAGE IN JOB
S1604
FIND NEXT SAMPLING POINT
S1605
ONLY K COMPONENT?
NO
S1609
NOTIFY SERVER THAT PAGE IS COLOR IMAGE PAGE
YES
NO
COLOR OR BLACK-AND-WHITE DETERMINATION FOR PAGE COMPLETED?
S1606
PRINT PAGE IN COLOR
S1610
YES
S1611
NOTIFY SERVER THAT PAGE IS BLACK-AND-WHITE IMAGE PAGE
NO
JOB COMPLETED?
S1612
YES
END

FIG. 16

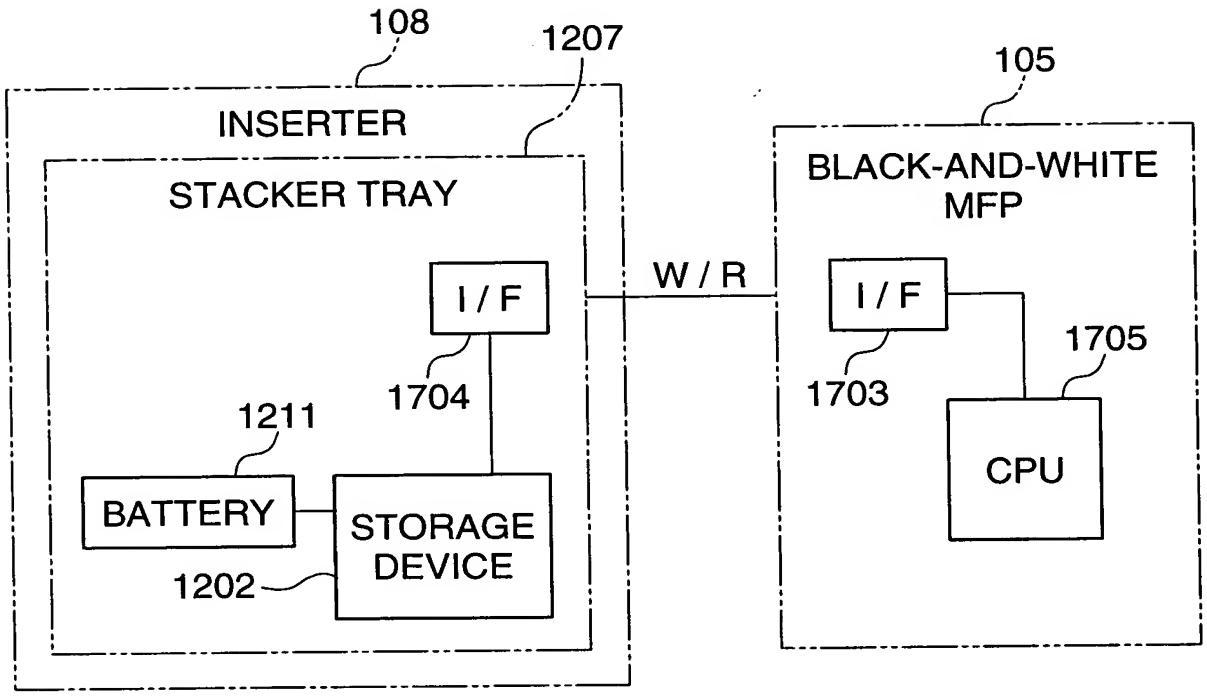

108
1207
105
INSERTER
STACKER TRAY
BLACK-AND-WHITE MFP
I / F
W / R
I / F
1704
1703
1705
1211
CPU
BATTERY
STORAGE DEVICE
1202

FIG. 17

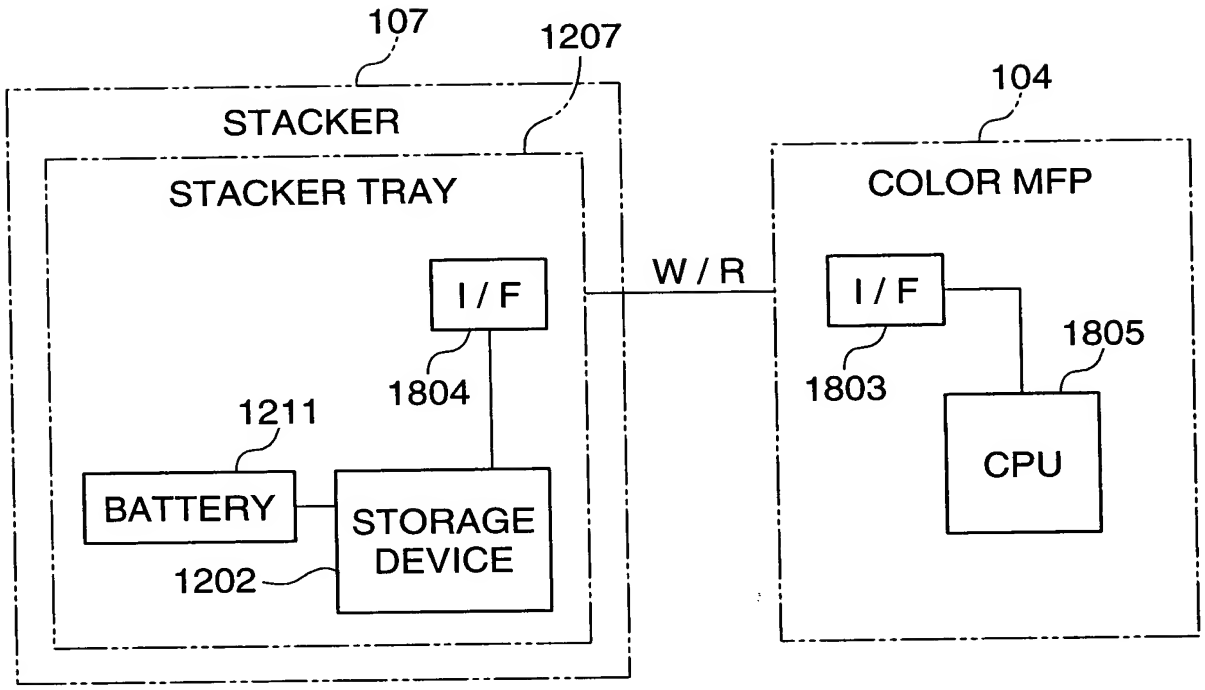

107
1207
104
STACKER
STACKER TRAY
COLOR MFP
I / F
W / R
I / F
1804
1805
1803
1211
CPU
BATTERY
STORAGE DEVICE
1202

FIG. 18

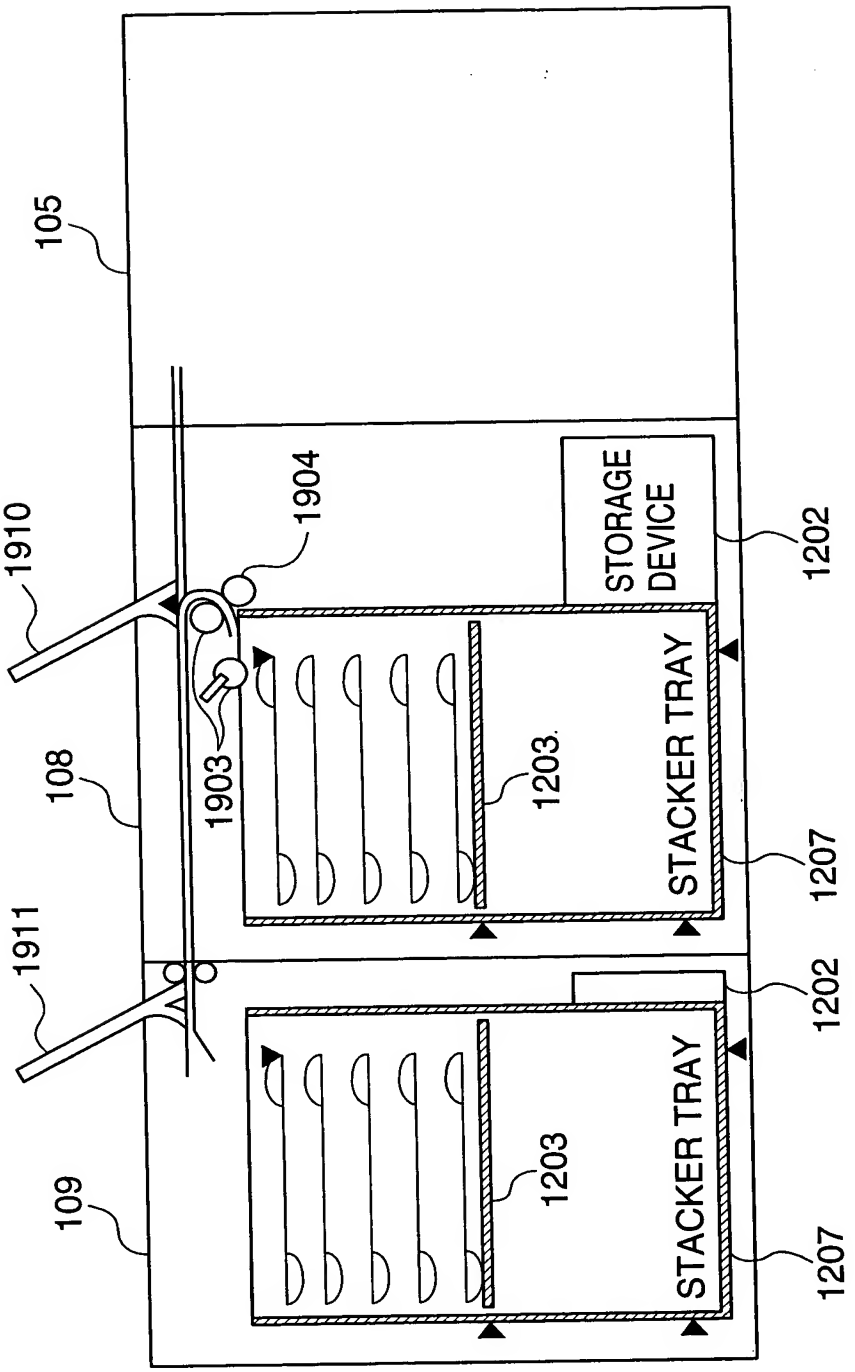

105
1910
1904
STORAGE DEVICE
1202
1903
1203
STACKER TRAY
1207
108
1911
1202
1203
STACKER TRAY
1207
109

FIG. 19

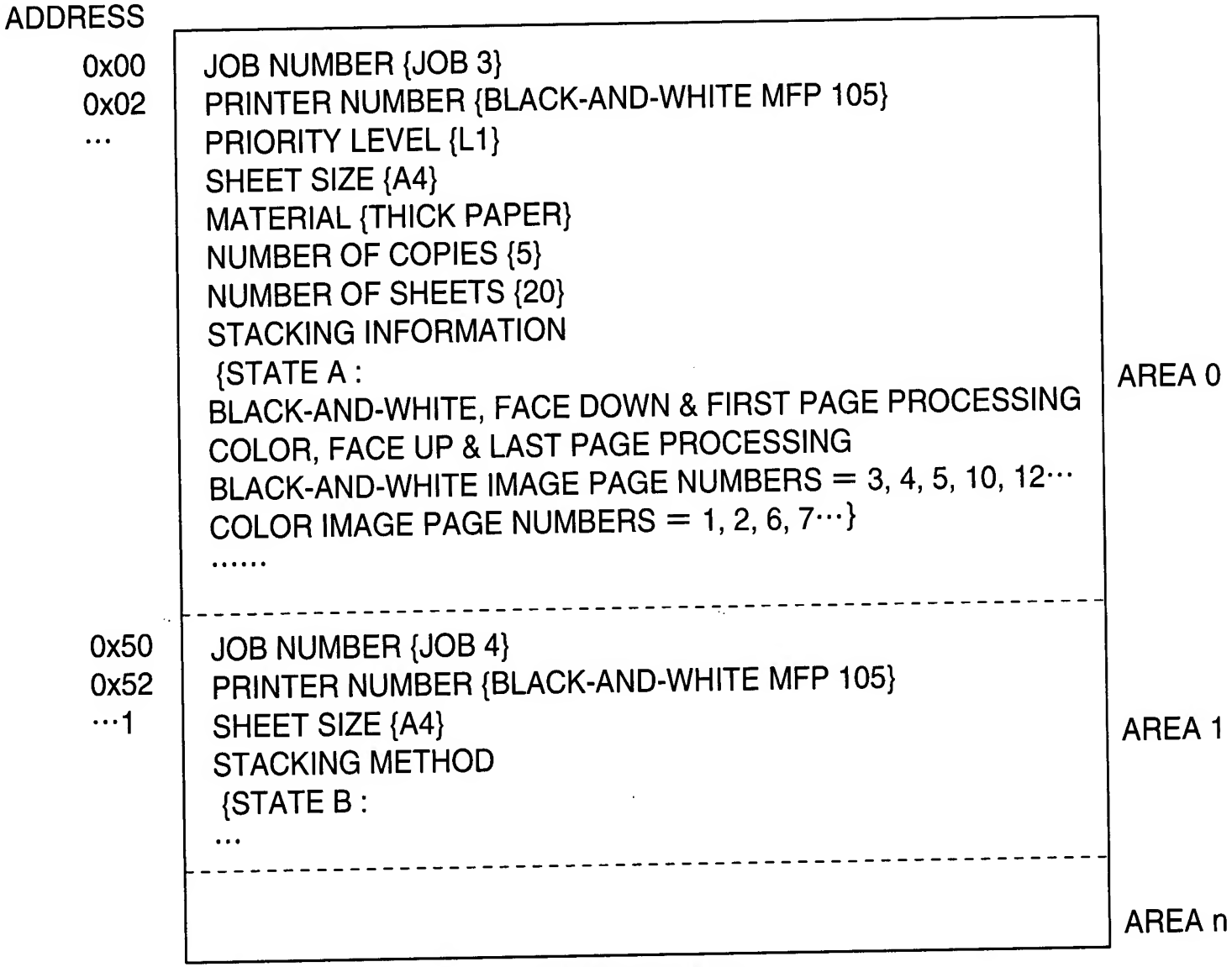

ADDRESS
0x00
0x02
…
JOB NUMBER {JOB 3}
PRINTER NUMBER {BLACK-AND-WHITE MFP 105}
PRIORITY LEVEL {L1}
SHEET SIZE {A4}
MATERIAL {THICK PAPER}
NUMBER OF COPIES {5}
NUMBER OF SHEETS {20}
STACKING INFORMATION
{STATE A :
BLACK-AND-WHITE, FACE DOWN & FIRST PAGE PROCESSING
COLOR, FACE UP & LAST PAGE PROCESSING
BLACK-AND-WHITE IMAGE PAGE NUMBERS = 3, 4, 5, 10, 12…
COLOR IMAGE PAGE NUMBERS = 1, 2, 6, 7…}
……
AREA 0
0x50
0x52
…1
JOB NUMBER {JOB 4}
PRINTER NUMBER {BLACK-AND-WHITE MFP 105}
SHEET SIZE {A4}
STACKING METHOD
{STATE B :
…
AREA 1
AREA n
MEMORY MAP

FIG. 20

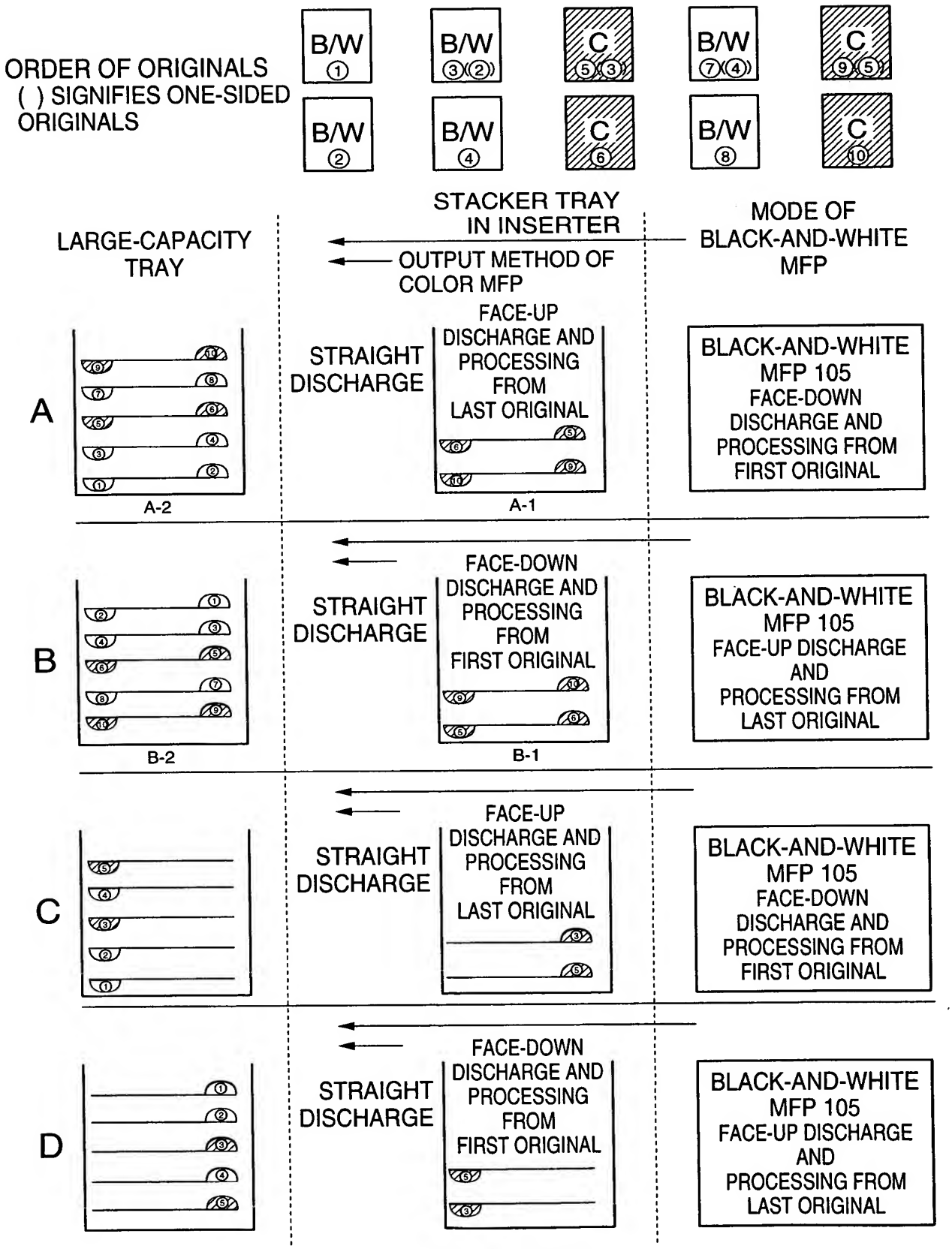

ORDER OF ORIGINALS
( ) SIGNIFIES ONE-SIDED ORIGINALS
B/W (1)
B/W (3)(2)
C (5)(3)
B/W (7)(4)
C (9)(5)
B/W (2)
B/W (4)
C (6)
B/W (8)
C (10)
LARGE-CAPACITY TRAY
STACKER TRAY IN INSERTER
OUTPUT METHOD OF COLOR MFP
MODE OF BLACK-AND-WHITE MFP
A
STRAIGHT DISCHARGE
FACE-UP DISCHARGE AND PROCESSING FROM LAST ORIGINAL
BLACK-AND-WHITE MFP 105 FACE-DOWN DISCHARGE AND PROCESSING FROM FIRST ORIGINAL
A-2
A-1
B
STRAIGHT DISCHARGE
FACE-DOWN DISCHARGE AND PROCESSING FROM FIRST ORIGINAL
BLACK-AND-WHITE MFP 105 FACE-UP DISCHARGE AND PROCESSING FROM LAST ORIGINAL
B-2
B-1
C
STRAIGHT DISCHARGE
FACE-UP DISCHARGE AND PROCESSING FROM LAST ORIGINAL
BLACK-AND-WHITE MFP 105 FACE-DOWN DISCHARGE AND PROCESSING FROM FIRST ORIGINAL
D
STRAIGHT DISCHARGE
FACE-DOWN DISCHARGE AND PROCESSING FROM FIRST ORIGINAL
BLACK-AND-WHITE MFP 105 FACE-UP DISCHARGE AND PROCESSING FROM LAST ORIGINAL

FIG. 21

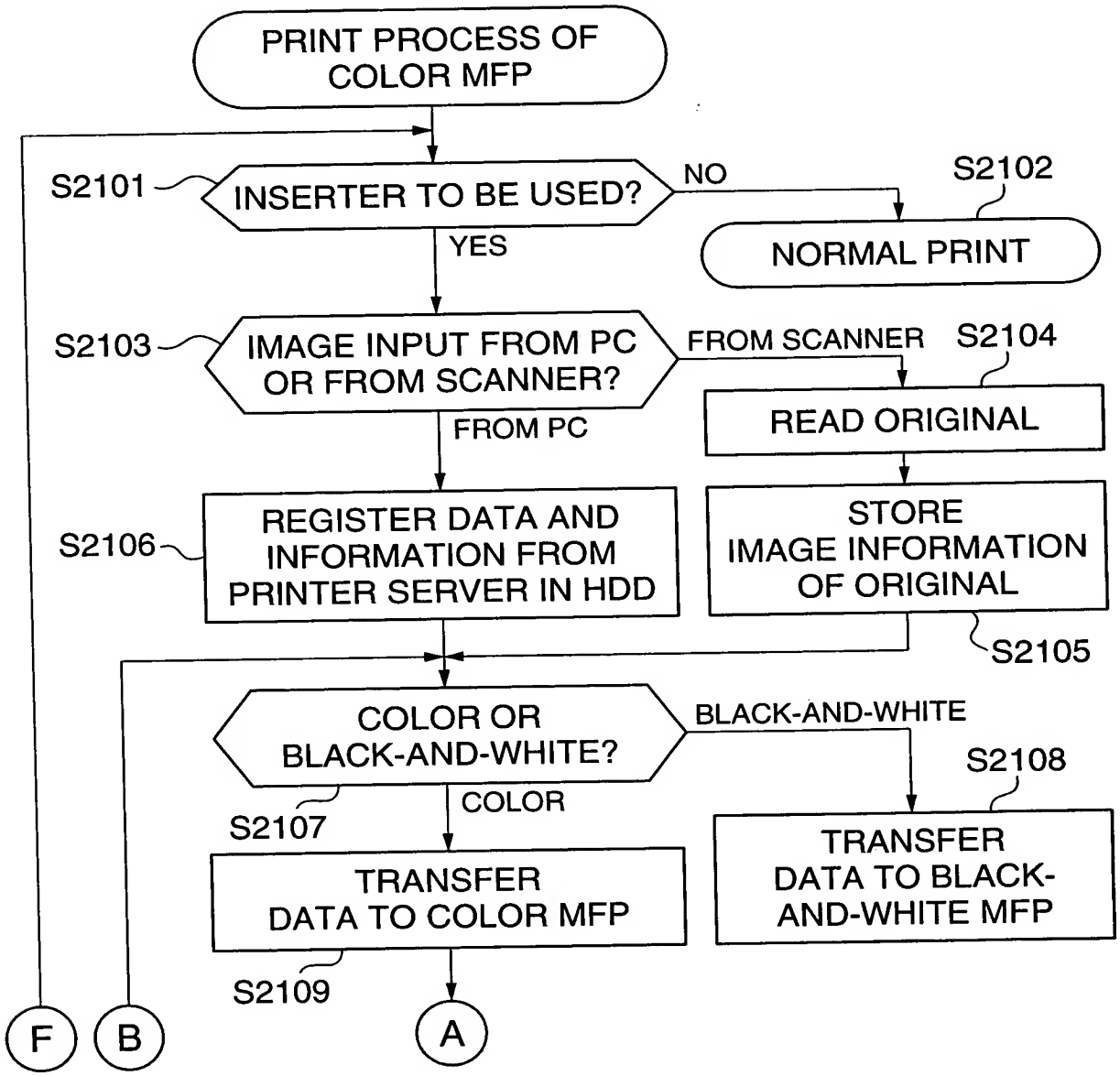

PRINT PROCESS OF COLOR MFP
S2101
INSERTER TO BE USED?
NO
S2102
NORMAL PRINT
YES
S2103
IMAGE INPUT FROM PC OR FROM SCANNER?
FROM SCANNER
S2104
READ ORIGINAL
FROM PC
S2106
REGISTER DATA AND INFORMATION FROM PRINTER SERVER IN HDD
STORE IMAGE INFORMATION OF ORIGINAL
S2105
COLOR OR BLACK-AND-WHITE?
BLACK-AND-WHITE
S2108
S2107
COLOR
TRANSFER DATA TO BLACK-AND-WHITE MFP
TRANSFER DATA TO COLOR MFP
S2109
F
B
A

FIG. 22

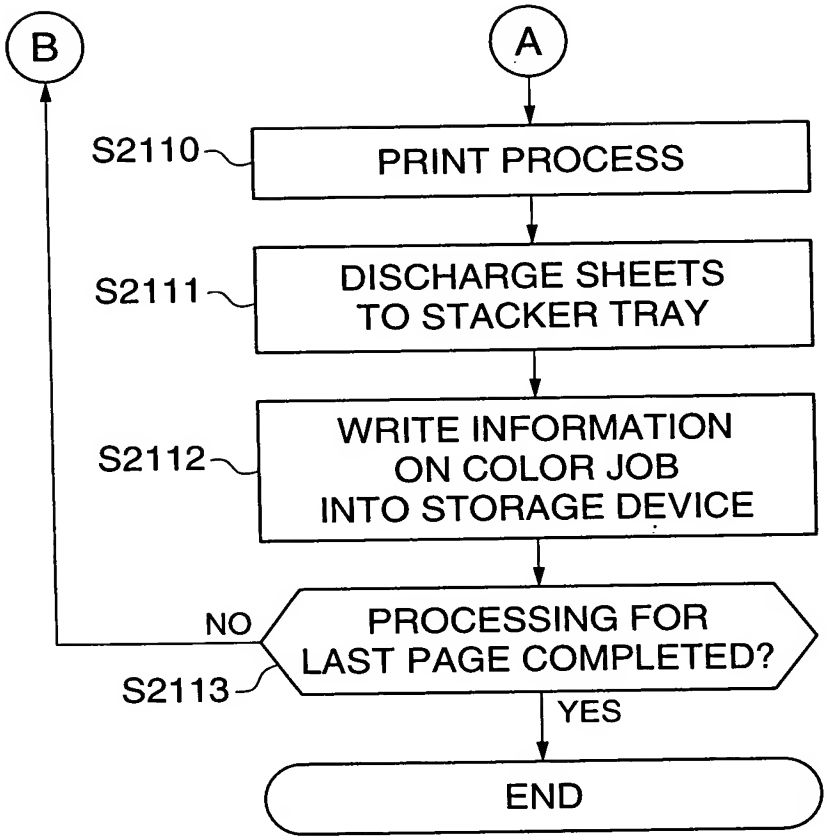

B
A
S2110
PRINT PROCESS
S2111
DISCHARGE SHEETS TO STACKER TRAY
S2112
WRITE INFORMATION ON COLOR JOB INTO STORAGE DEVICE
NO
S2113
PROCESSING FOR LAST PAGE COMPLETED?
YES
END

FIG. 23

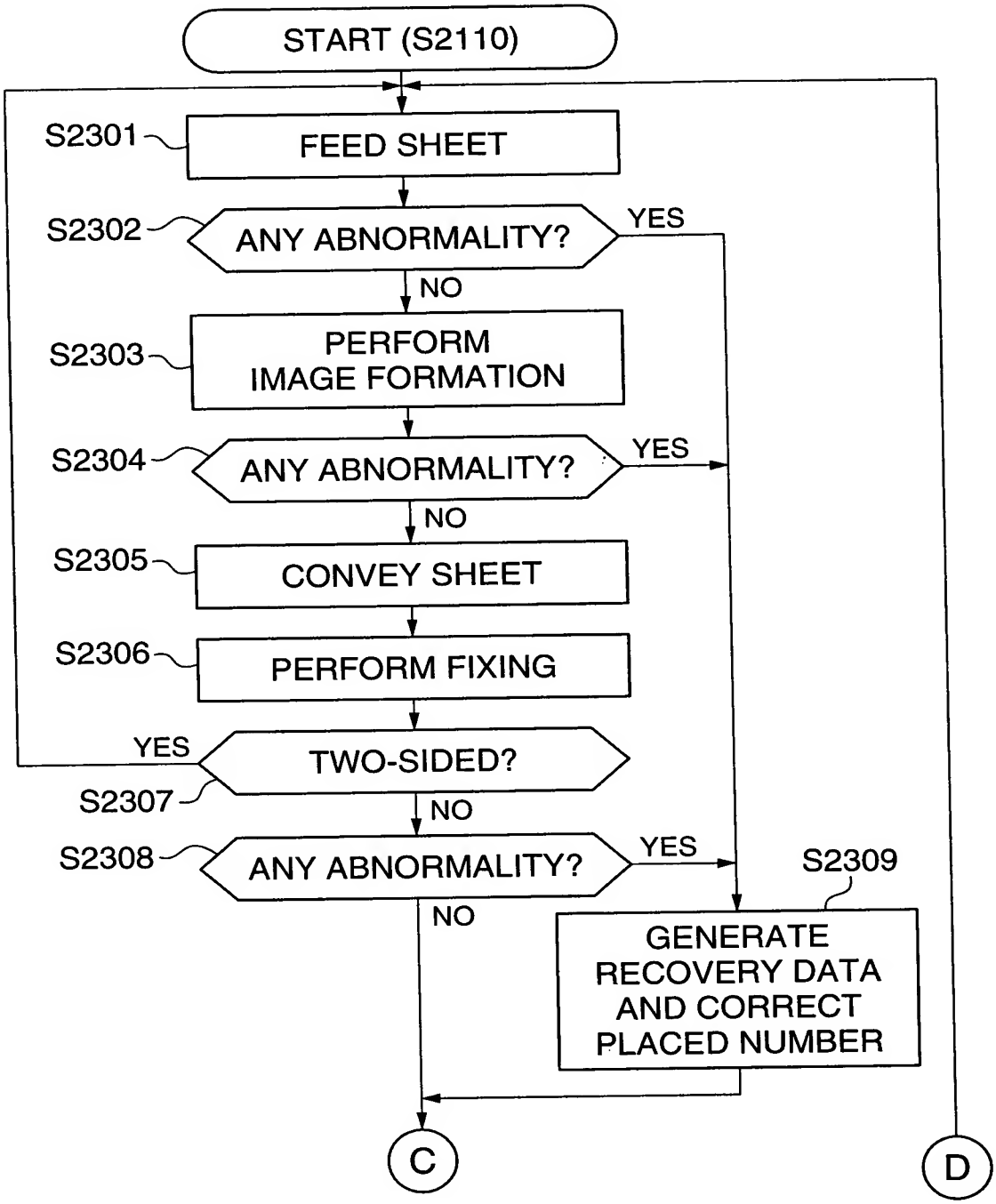

START (S2110)
S2301
FEED SHEET
S2302
ANY ABNORMALITY?
YES
NO
S2303
PERFORM IMAGE FORMATION
S2304
ANY ABNORMALITY?
YES
NO
S2305
CONVEY SHEET
S2306
PERFORM FIXING
YES
TWO-SIDED?
S2307
NO
S2308
ANY ABNORMALITY?
YES
S2309
NO
GENERATE RECOVERY DATA AND CORRECT PLACED NUMBER
C
D

FIG. 24

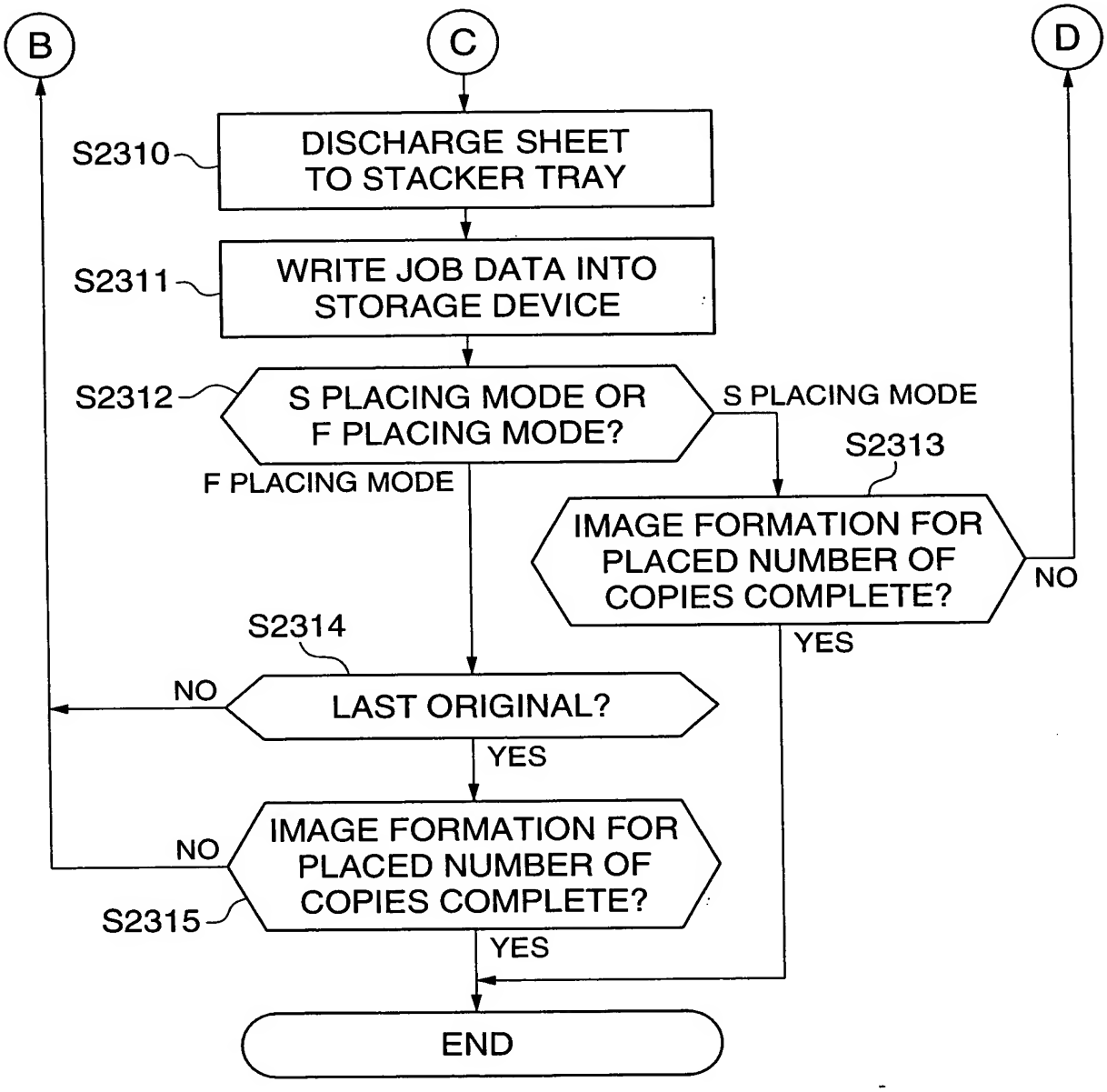

B
C
D
S2310
DISCHARGE SHEET TO STACKER TRAY
S2311
WRITE JOB DATA INTO STORAGE DEVICE
S2312
S PLACING MODE OR F PLACING MODE?
S PLACING MODE
F PLACING MODE
S2313
IMAGE FORMATION FOR PLACED NUMBER OF COPIES COMPLETE?
NO
YES
S2314
NO
LAST ORIGINAL?
YES
NO
IMAGE FORMATION FOR PLACED NUMBER OF COPIES COMPLETE?
S2315
YES
END

FIG. 25

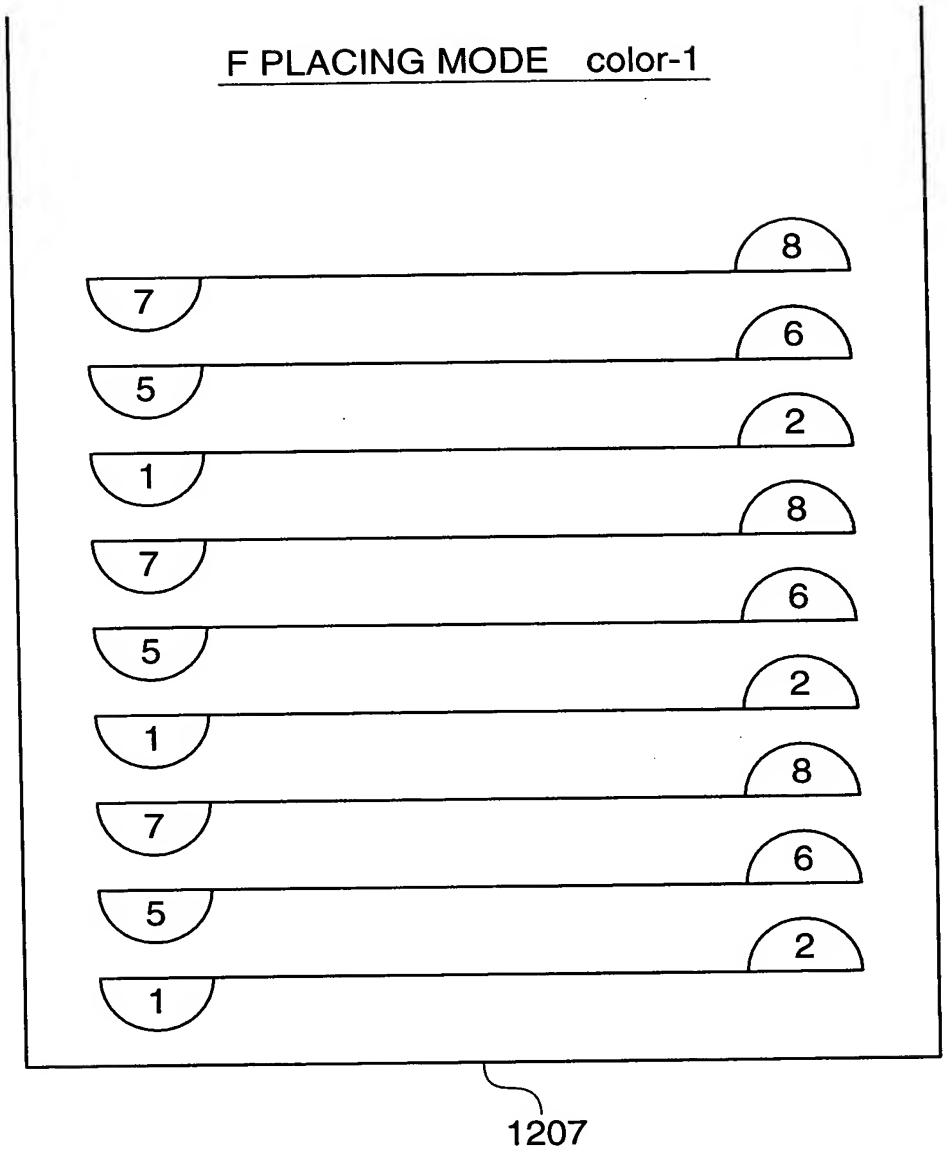


FIG. 26

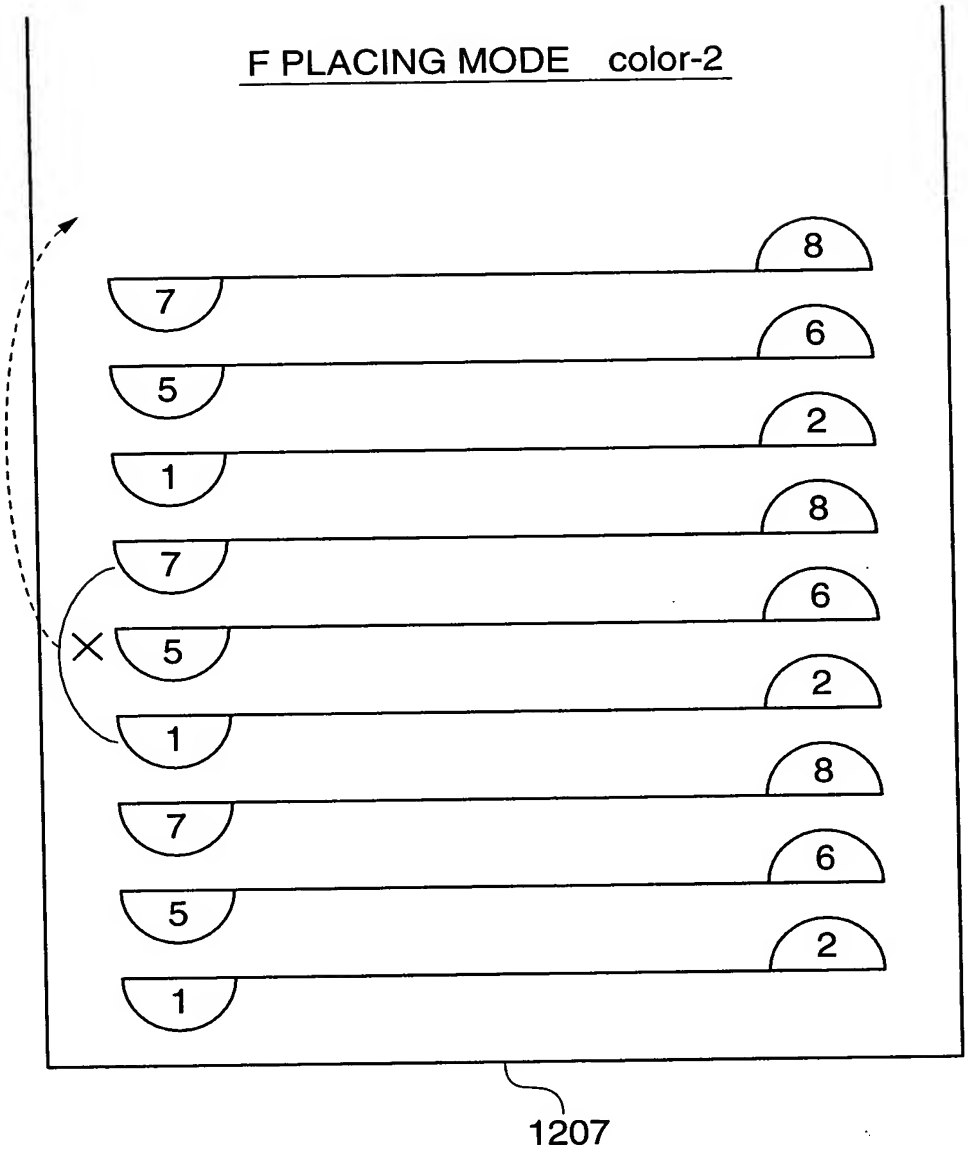


FIG. 27

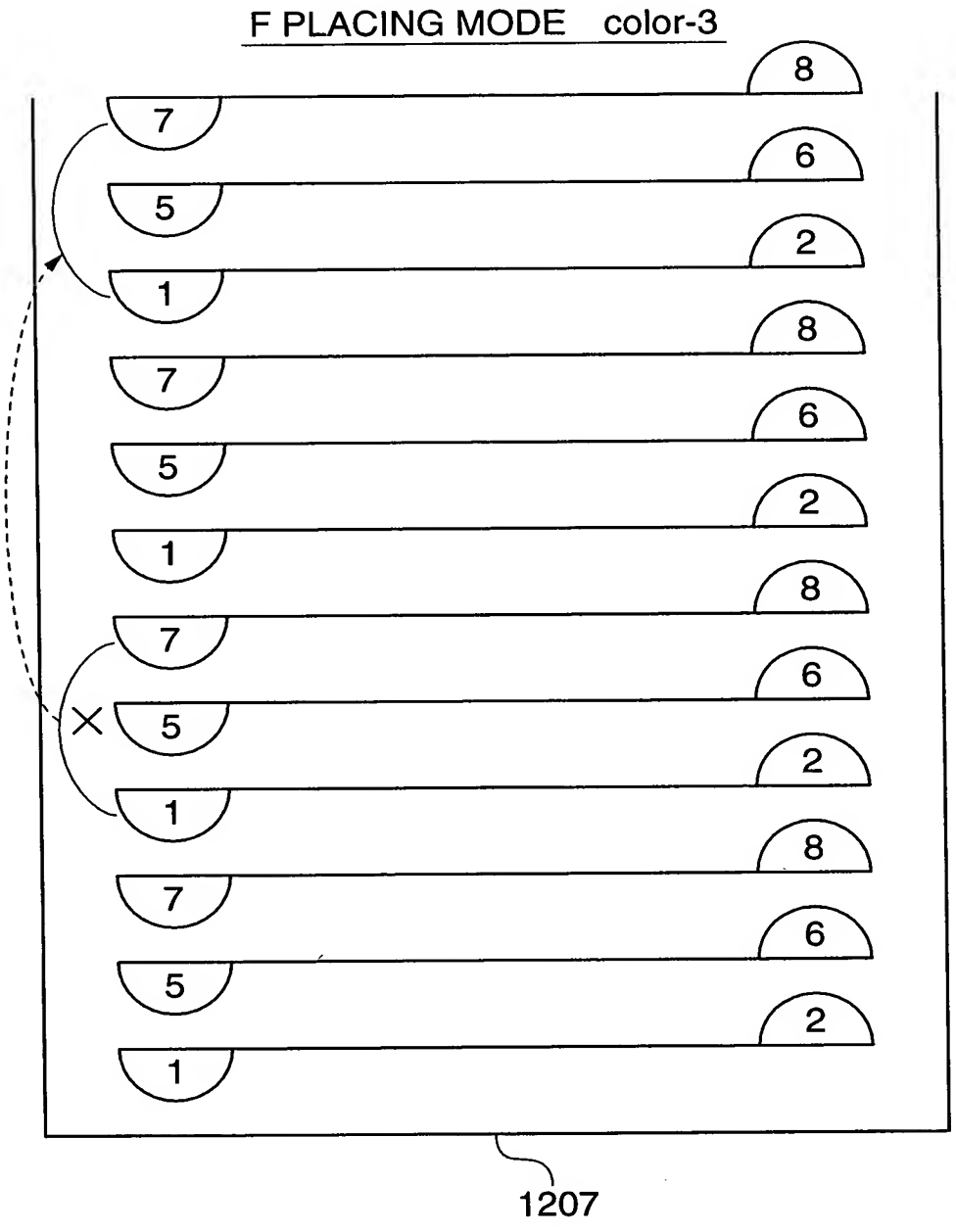


FIG. 28

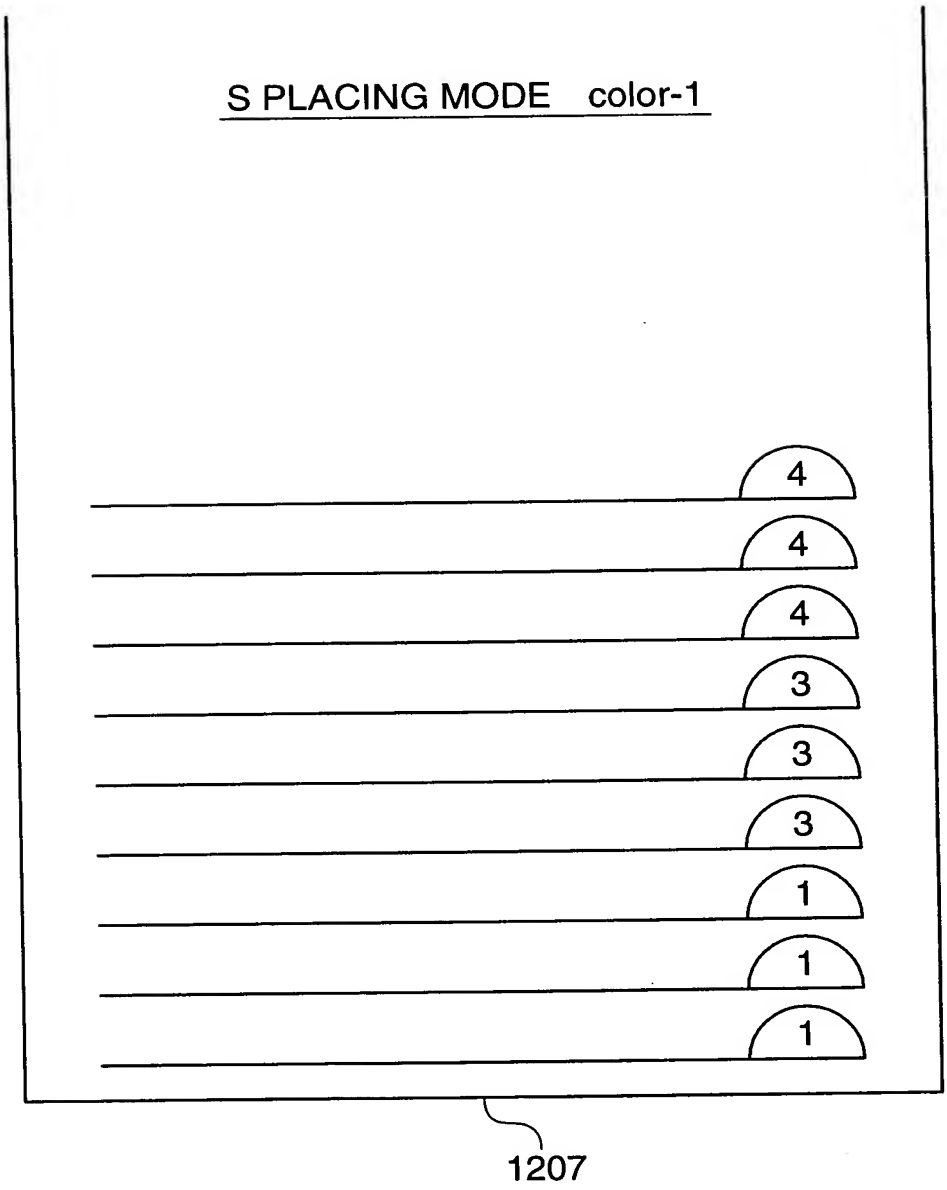


FIG. 29

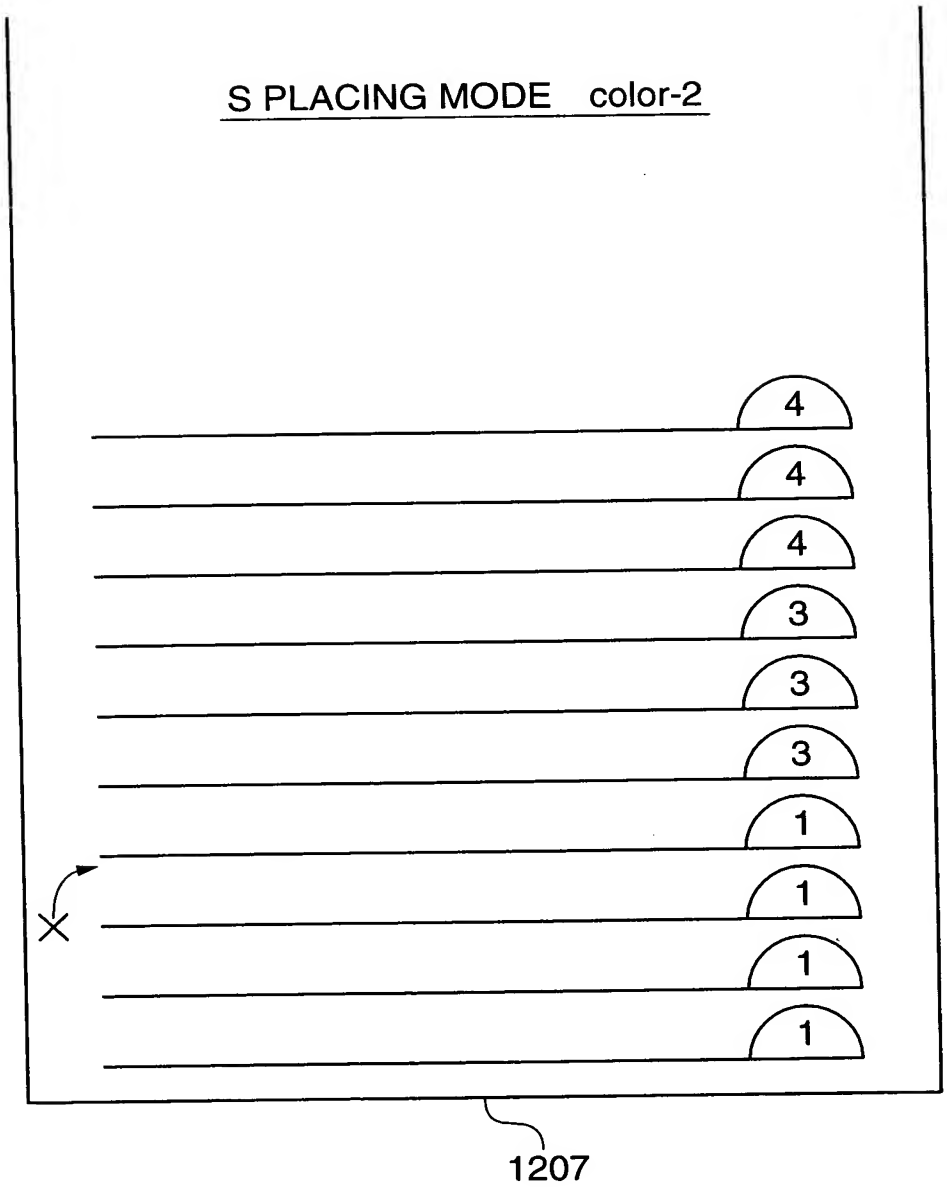


FIG. 30

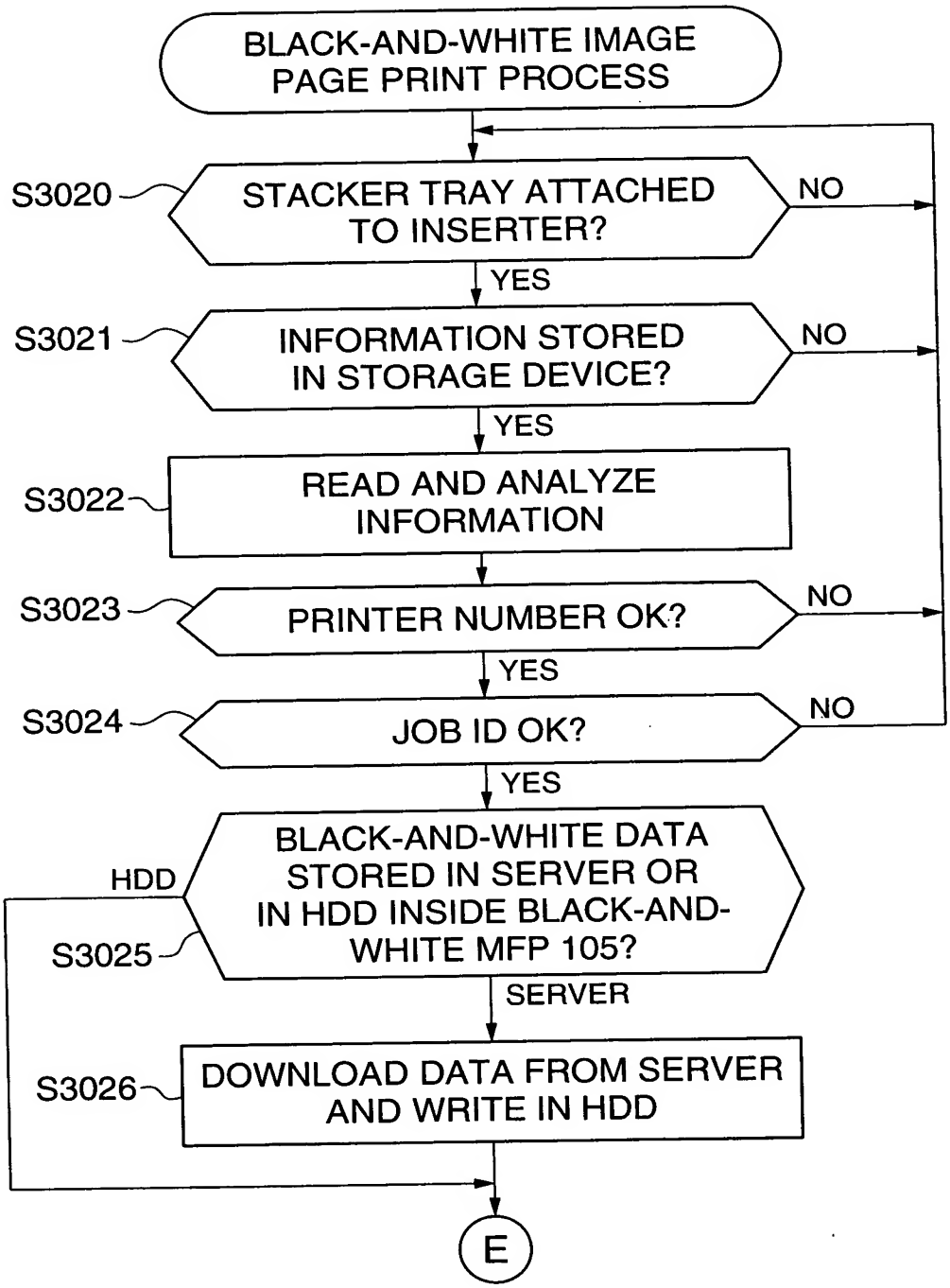

BLACK-AND-WHITE IMAGE PAGE PRINT PROCESS
S3020
STACKER TRAY ATTACHED TO INSERTER?
NO
YES
S3021
INFORMATION STORED IN STORAGE DEVICE?
NO
YES
S3022
READ AND ANALYZE INFORMATION
S3023
PRINTER NUMBER OK?
NO
YES
S3024
JOB ID OK?
NO
YES
HDD
S3025
BLACK-AND-WHITE DATA STORED IN SERVER OR IN HDD INSIDE BLACK-AND-WHITE MFP 105?
SERVER
S3026
DOWNLOAD DATA FROM SERVER AND WRITE IN HDD
E

FIG. 31

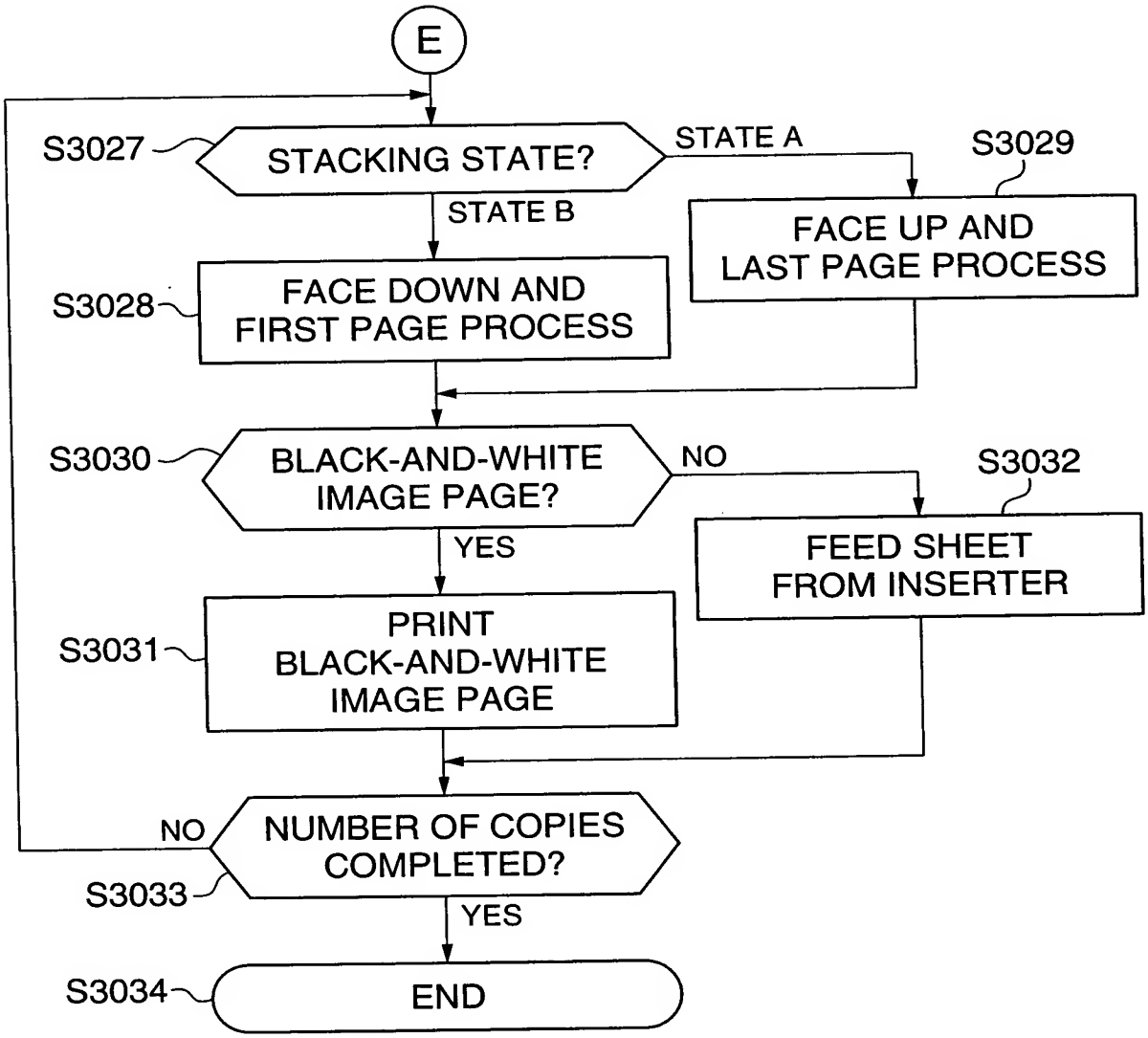

E
S3027
STACKING STATE?
STATE A
S3029
STATE B
FACE UP AND LAST PAGE PROCESS
S3028
FACE DOWN AND FIRST PAGE PROCESS
S3030
BLACK-AND-WHITE IMAGE PAGE?
NO
S3032
YES
FEED SHEET FROM INSERTER
S3031
PRINT BLACK-AND-WHITE IMAGE PAGE
NO
NUMBER OF COPIES COMPLETED?
S3033
YES
S3034
END

FIG. 32

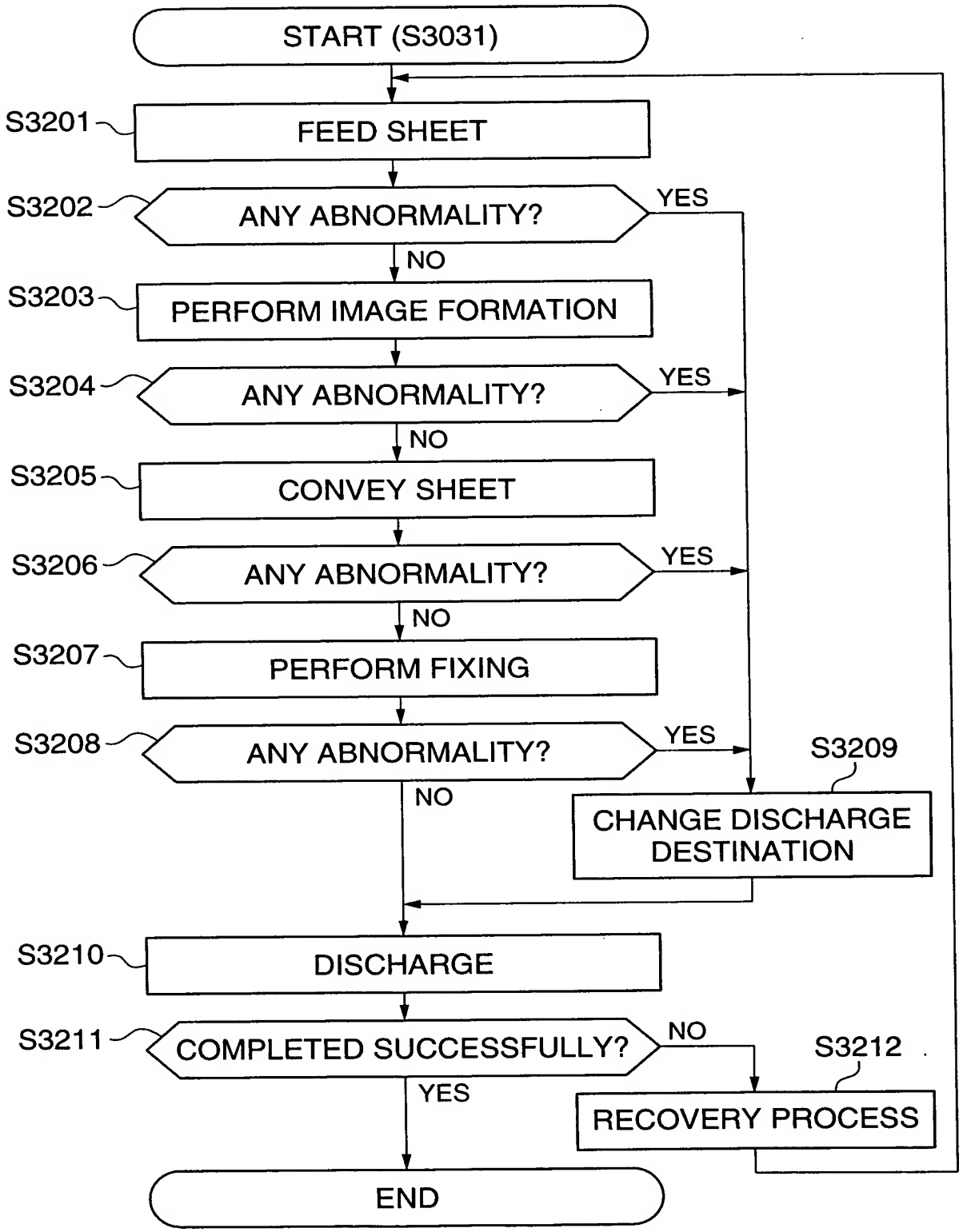

START (S3031)
S3201
FEED SHEET
S3202
ANY ABNORMALITY?
YES
NO
S3203
PERFORM IMAGE FORMATION
S3204
ANY ABNORMALITY?
YES
NO
S3205
CONVEY SHEET
S3206
ANY ABNORMALITY?
YES
NO
S3207
PERFORM FIXING
S3208
ANY ABNORMALITY?
YES
NO
S3209
CHANGE DISCHARGE DESTINATION
S3210
DISCHARGE
S3211
COMPLETED SUCCESSFULLY?
NO
YES
S3212
RECOVERY PROCESS
END

FIG. 33

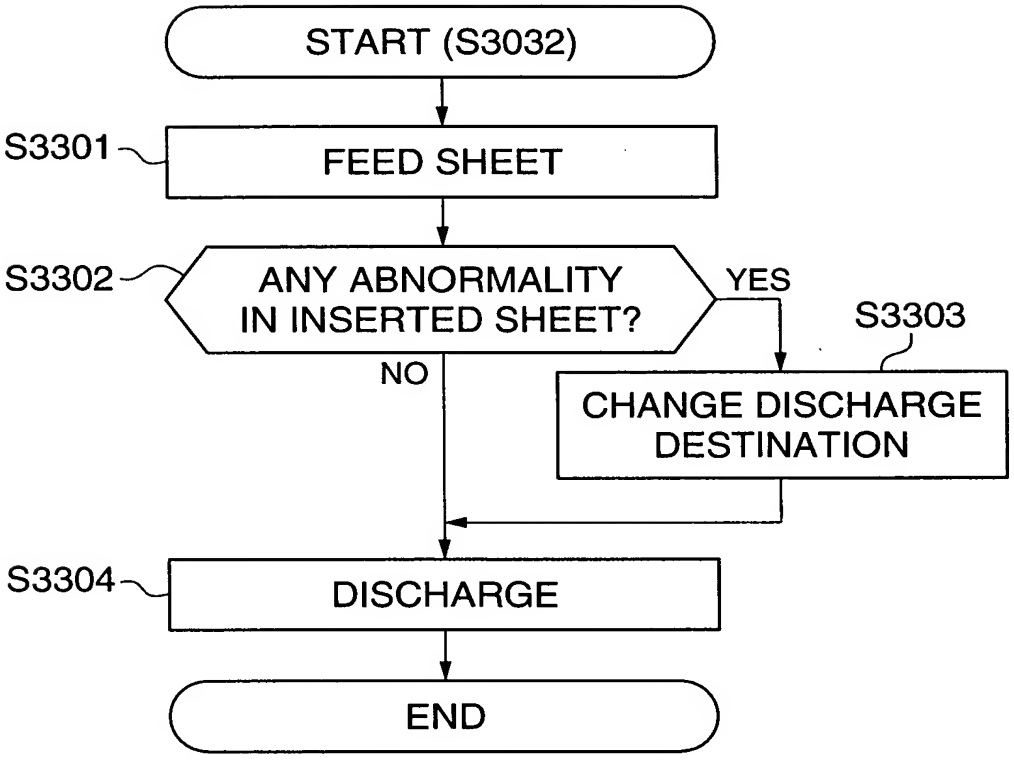

START (S3032)
S3301
FEED SHEET
S3302
ANY ABNORMALITY IN INSERTED SHEET?
YES
S3303
NO
CHANGE DISCHARGE DESTINATION
S3304
DISCHARGE
END

FIG. 34

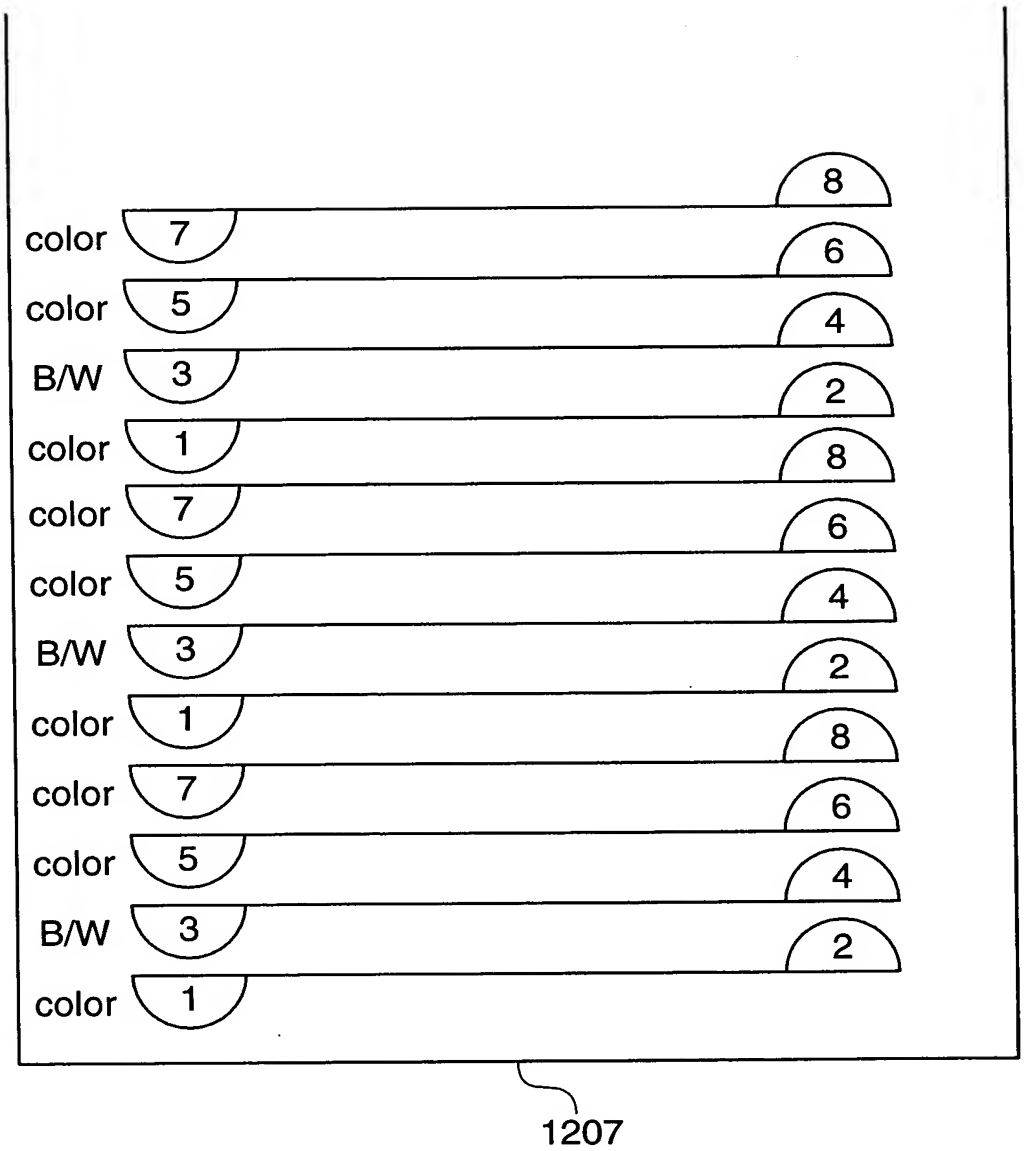

color 7
8
color 5
6
B/W 3
4
color 1
2
color 7
8
color 5
6
B/W 3
4
color 1
2
color 7
8
color 5
6
B/W 3
4
color 1
2
1207

FIG. 35

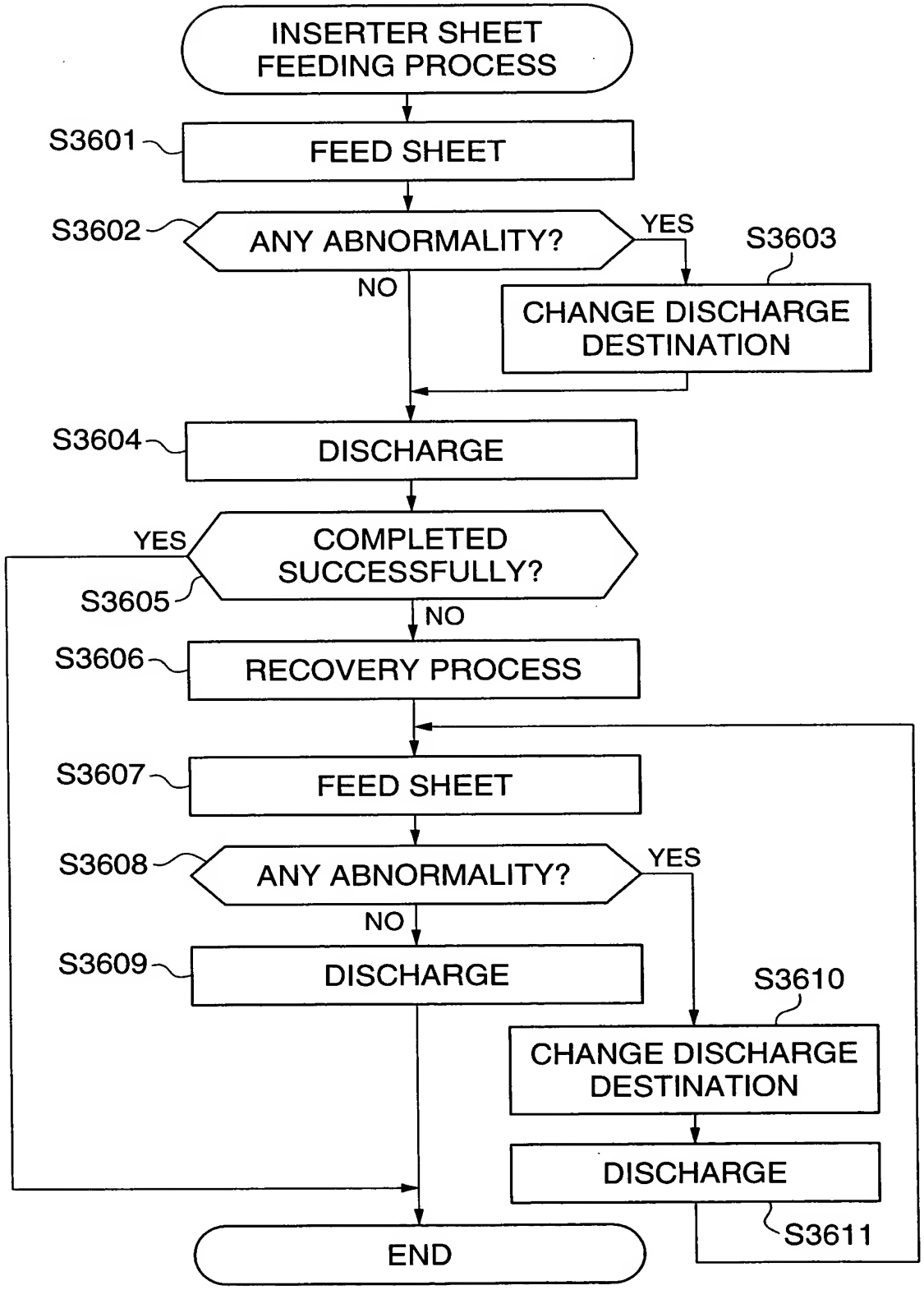

INSERTER SHEET FEEDING PROCESS
S3601
FEED SHEET
S3602
ANY ABNORMALITY?
YES
S3603
NO
CHANGE DISCHARGE DESTINATION
S3604
DISCHARGE
YES
COMPLETED SUCCESSFULLY?
S3605
NO
S3606
RECOVERY PROCESS
S3607
FEED SHEET
S3608
ANY ABNORMALITY?
YES
NO
S3609
DISCHARGE
S3610
CHANGE DISCHARGE DESTINATION
DISCHARGE
S3611
END

FIG. 36

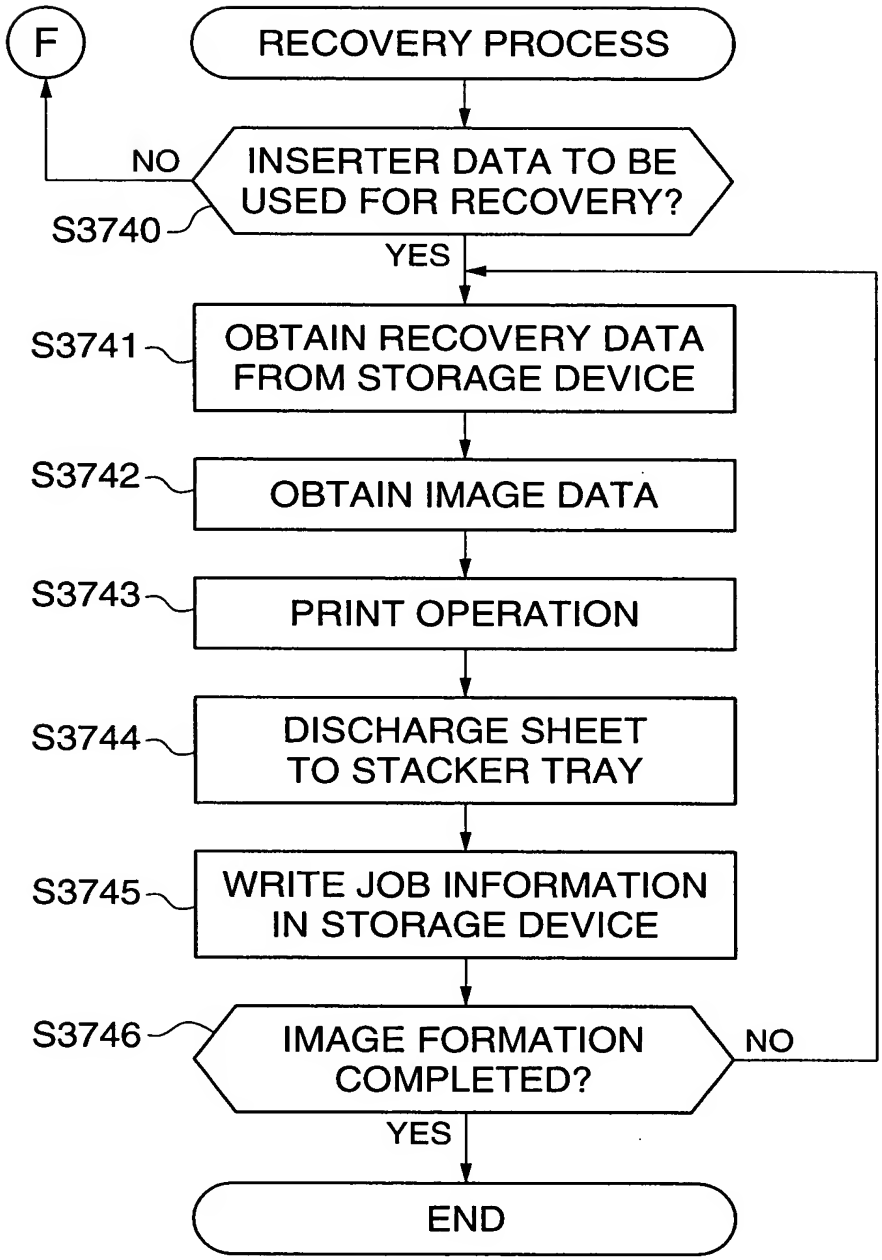

F
RECOVERY PROCESS
NO
INSERTER DATA TO BE USED FOR RECOVERY?
S3740
YES
S3741
OBTAIN RECOVERY DATA FROM STORAGE DEVICE
S3742
OBTAIN IMAGE DATA
S3743
PRINT OPERATION
S3744
DISCHARGE SHEET TO STACKER TRAY
S3745
WRITE JOB INFORMATION IN STORAGE DEVICE
S3746
IMAGE FORMATION COMPLETED?
NO
YES
END

FIG. 37

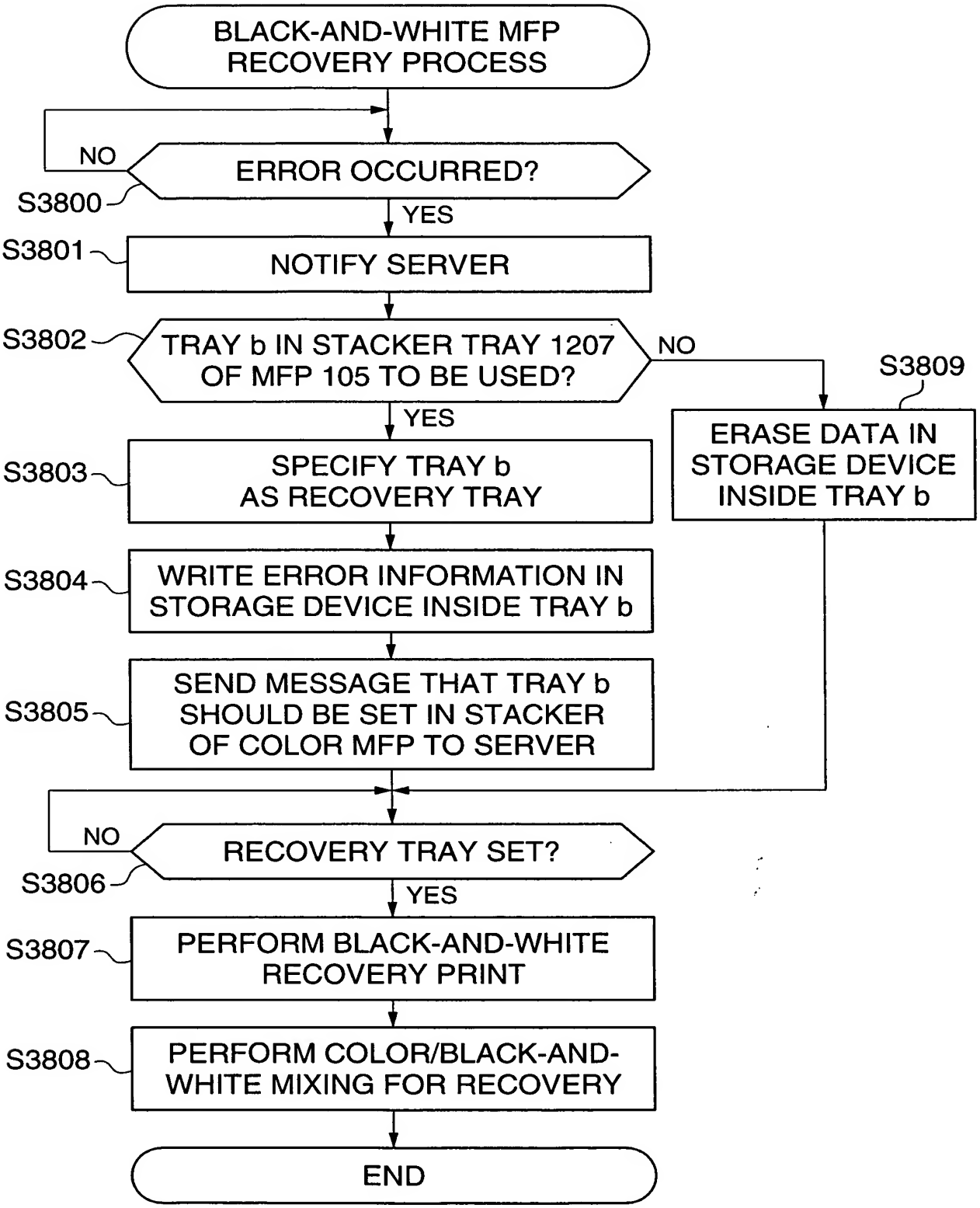

BLACK-AND-WHITE MFP RECOVERY PROCESS
NO
ERROR OCCURRED?
S3800
YES
S3801
NOTIFY SERVER
S3802
TRAY b IN STACKER TRAY 1207 OF MFP 105 TO BE USED?
NO
S3809
ERASE DATA IN STORAGE DEVICE INSIDE TRAY b
YES
S3803
SPECIFY TRAY b AS RECOVERY TRAY
S3804
WRITE ERROR INFORMATION IN STORAGE DEVICE INSIDE TRAY b
S3805
SEND MESSAGE THAT TRAY b SHOULD BE SET IN STACKER OF COLOR MFP TO SERVER
NO
RECOVERY TRAY SET?
S3806
YES
S3807
PERFORM BLACK-AND-WHITE RECOVERY PRINT
S3808
PERFORM COLOR/BLACK-AND-WHITE MIXING FOR RECOVERY
END

FIG. 38

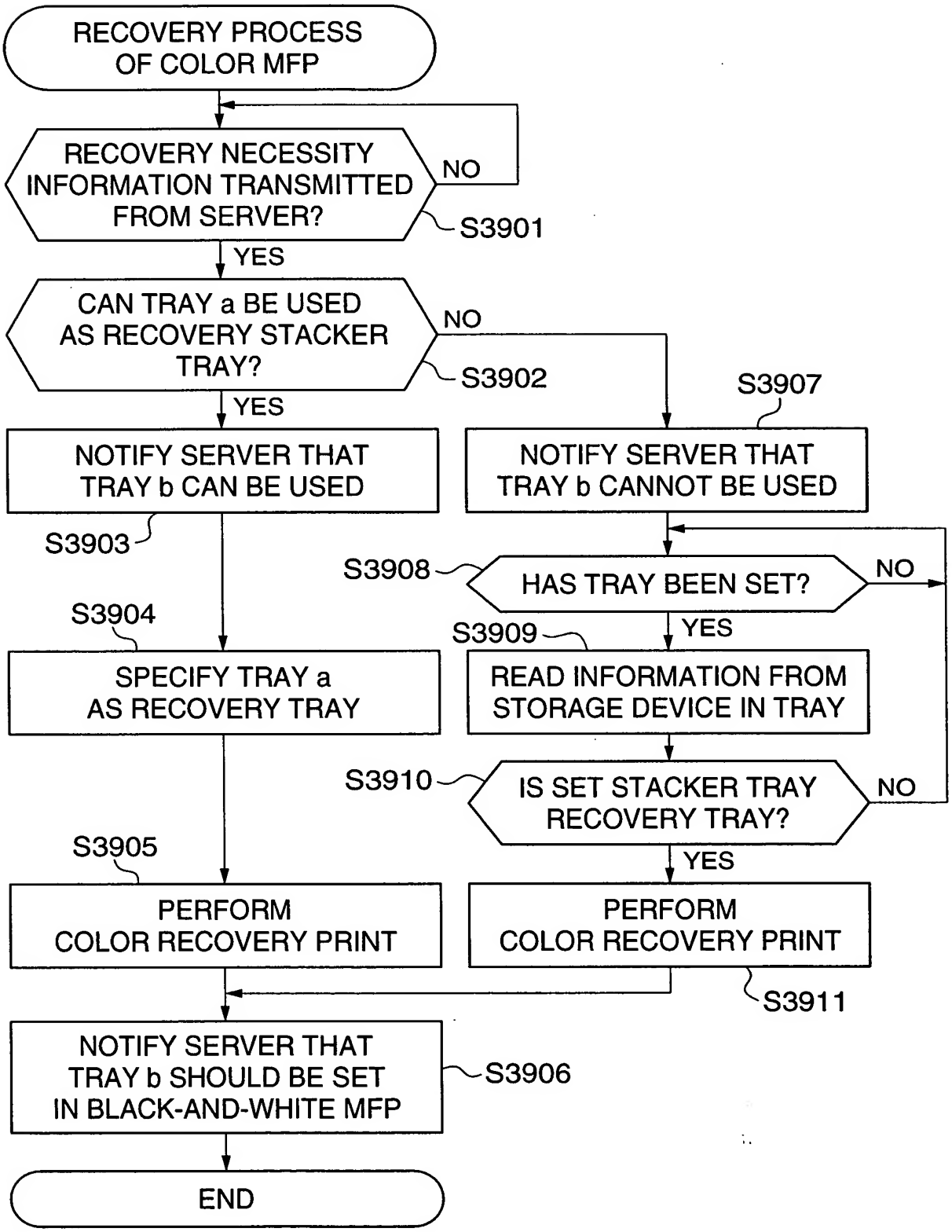
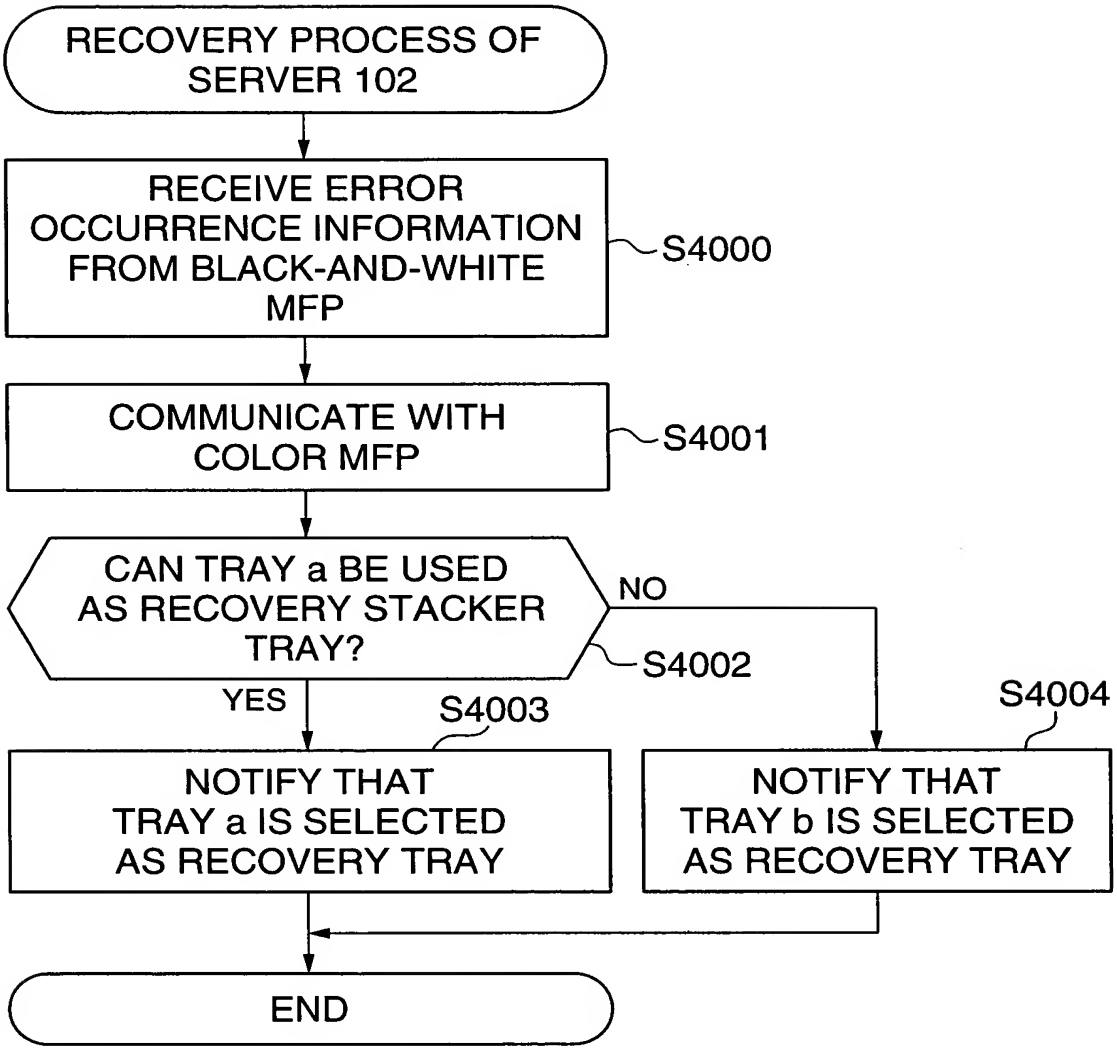

RECOVERY PROCESS OF COLOR MFP
RECOVERY NECESSITY INFORMATION TRANSMITTED FROM SERVER?
NO
S3901
YES
CAN TRAY a BE USED AS RECOVERY STACKER TRAY?
NO
S3902
YES
S3907
NOTIFY SERVER THAT TRAY b CAN BE USED
NOTIFY SERVER THAT TRAY b CANNOT BE USED
S3903
S3908
HAS TRAY BEEN SET?
NO
S3904
S3909
YES
SPECIFY TRAY a AS RECOVERY TRAY
READ INFORMATION FROM STORAGE DEVICE IN TRAY
S3910
IS SET STACKER TRAY RECOVERY TRAY?
NO
S3905
YES
PERFORM COLOR RECOVERY PRINT
PERFORM COLOR RECOVERY PRINT
S3911
NOTIFY SERVER THAT TRAY b SHOULD BE SET IN BLACK-AND-WHITE MFP
S3906
END

FIG. 39


RECOVERY PROCESS OF SERVER 102
RECEIVE ERROR OCCURRENCE INFORMATION FROM BLACK-AND-WHITE MFP
S4000
COMMUNICATE WITH COLOR MFP
S4001
CAN TRAY a BE USED AS RECOVERY STACKER TRAY?
NO
S4002
YES
S4003
S4004
NOTIFY THAT TRAY a IS SELECTED AS RECOVERY TRAY
NOTIFY THAT TRAY b IS SELECTED AS RECOVERY TRAY
END